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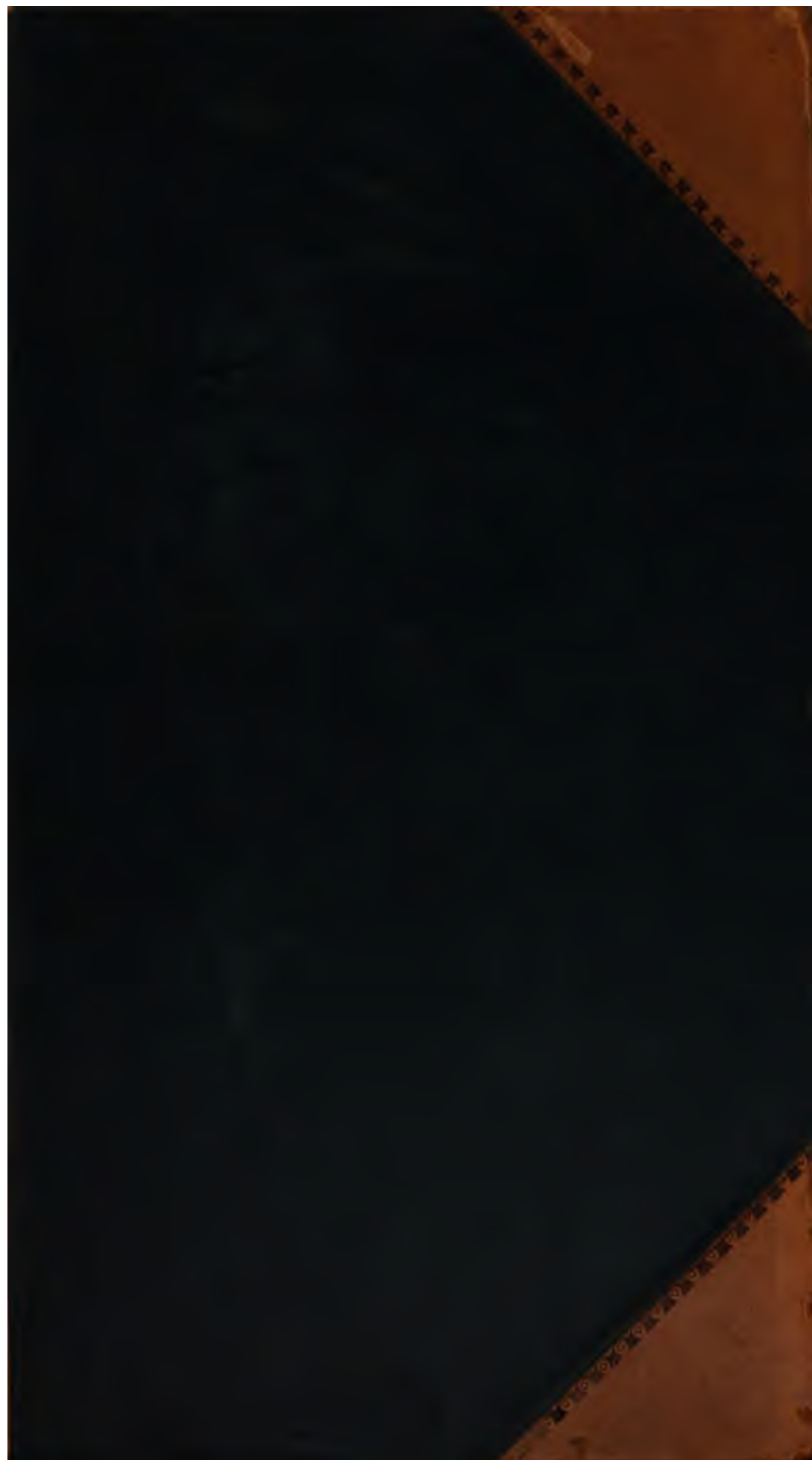
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Per. 19192 d. $\frac{196}{N.S. 45}$



THE
BRITISH
FARMER'S MAGAZINE.
NEW SERIES.

Agriculture not only gives riches to a nation, but the only riches she can call her own.—DR. JOHNSON.

VOL. XLV.



LONDON:
ROGERSON AND TUXFORD, 246, STRAND.
1863.

LONDON:

PRINTED BY ROGERSON AND TUXFORD, 246, STRAND

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F. G. 1841

"The Beauty of the East"

Engraved by F. G. 1841

THE BRITISH FARMER'S MAGAZINE.

NEW SERIES.

VOL. XLIV.

1863.

NO. CVIII.

PLATE I.

LARK; A SUSSEX COW.

THE PROPERTY OF MR. EDWARD CANE, OF BERWICK COURT, LEWES.

Lark, bred by Mr. Cane, is by Unicorn, out of Loyalty; good pedigree blood on either side, as duly registered in the Sussex Herd Book, of which her owner is one of the editors.

Lark was nearly six years old when, after having bred two calves, she came on as a fat cow last Christmas with very deserved success. At the Sussex County Fat Stock Show, at Brighton, she took the premium of £20 as "the best cow or heifer of any breed," beating Shorthorns, Devons, and Sussex; and in a week or two afterwards another first of £20, with a silver medal for the breeder, as "the best Sussex cow or heifer," at the Smithfield Club Show in the Agricultural Hall, where we thus spoke of her:—

"When the Judges went for the best of all the cows and heifers, it is said, that, as often happens, they had each one of them his choice. Mr. Vevers, of course, took to Mr. Turner's cow; Captain

Davy as certainly to Mr. Farthing's heifer; while Mr. Sanday had to divide his attentions between Rosa and Rosette. But there was even another out before them, although with no special retainer put in on her behalf, and this was Mr. Cane's Sussex cow, the best of a very excellent class, and one that has from the first proved the right to a rank of its own at the Smithfield Club Shows. Level and straight, with great style, a capital touch, and a fine clean head, Lark is, as we said of her at Brighton, 'all over a good one' with Mr. Napper's 'straight handsome beast,' now third to her, and Mr. Coote's good cow promoted. Both these classes of oxen and cows of the Sussex breed were more than creditable to the county from which they take their title, the men of Kent having little or no share in the show of them."

Lark was sold in the Hall to Mr. E. Davey, butcher, of Brighton.

PLATE II.

"THE MEMORY OF THE PAST."

In our plate we have an old, blind, worn-out hunter, who has fallen into the hands of gipsies, and the companionship of the dull ass, suddenly put into an ecstasy of delight by a lively recollection of the memory of the past, produced by the ringing echo of the huntsman's horn and the cry of hounds in full chase. The steeple-chase horse Lottery, during the dinner hour, as we were told by the carter, once hearing the harriers not far distant, pricked up his ears, hopped over the fence into the lane with all the ease of former days, and joined the merry little pack, not with his old companion in victory on his back, but with a set of cart-harness, chains, and the spreader dangling over his loins. Horses and hounds enjoy hunting as much as we do ourselves, and no doubt have

their reminiscences also. We were much amused one evening in the smoking-room of an inn in Bedfordshire, with a fox-hound slumbering on the hearth-rug, and going again, by the way he gave tongue, through some brushing run, in days long vanished, from Knotting Fox or Kempston Wood. Tom Moore must surely have been thinking of fox-hunting, and not of the splendid misery at the Hollands—for which, though he flew to the world, dear Bessy, from thee, to whistle for his breakfast and sing for his supper—when he warbled:

"When time, who steals our hours away,
Shall steal our pleasures too,
The memory of the past will stay,
And half our joys renew."

OUR GRASS AND HAY.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

The attempt to increase the produce of our grass lands by artificial means has originated in rather modern times. Our ancestors were content to leave the enrichment of their meadows to the deposits from the flood waters. The more upland pastures were left to the sheep, and to Nature's care. In those quiet farming days they in fact knew little of artificial dressings, rarely deemed it even necessary to remove stagnant waters from their pastures. Time, however, has produced vast advances in the management of our grasses. Nature's valuable hints, sooner or later, become better regarded. Chemistry has explained her operations, taught the farmer to act, and to improve upon them. The effect of wood ashes—as on the site of a fire—in producing white clover, led to the trial and use of peat ashes by the Belgian farmers, and by those in our valley of the Kennet. Then the chemist, having examined these ashes, showed that they contained two or three salts of lime—the carbonate, sulphate, and the phosphate—to which their fertilising powers are chiefly owing. This led to the use of other dressings for grass lands, in which two of these salts abound to a far greater extent than in vegetable ashes; such as crushed bones and the guano of Peru, and the effect in both cases was found to be still more powerful than from the use of ashes. The grass was very materially increased in bulk, the number of the plants of clover and other valuable grasses was enlarged, whilst that of the coarser inferior kinds was very materially diminished. And, again, when the same salts were applied to grass lands, by feeding stock depastured on them with oilcake (in which phosphates abound), a similar result on the herbage was gradually produced. The number of the plants of the inferior grasses was lessened, that of the more valuable kinds considerably increased.

The appearance (spontaneously) of white clover and other grasses upon soils dressed with phosphatic manures naturally led to the conclusion that in these ashes a considerable proportion of phosphate of lime would be found. Upon a chemical examination this suspicion was verified. In 100 parts of the ashes of white clover analyzed by poor Fownes (whose early death every farmer had cause to lament), were contained more than 30 per cent. of phosphate of lime. The result of the analysis of the ash was as follows:

Carbonate of potash	39.45
Sulphate of potash	12.1
Chloride of potassium	4.7
Silica	1.0
Earthy phosphates, &c.	30.5
Carbonate of lime	5.0
Sandy matter	4.0
Water	1.5
Loss	1.75
	100.00

We see, then, from this analysis, why the application of phosphate of lime to a soil in which the seeds of white clover are contained promotes their growth, and enables the plants to overpower and occupy the place of the inferior grasses. There is the weed couch or twitch, whose appearance and vigorous growth on some sandy soils has puzzled many an intelligent cultivator. This may well be denominated an

agrarian weed; for it seems to follow, as it were, the plough, on some soils, in a remarkable way. For instance, an upland pasture is broken up, in which this grass does not exist; the land is brought into cultivation, is manured, and root and cereal crops obtained, and then the couch speedily makes its appearance. Several circumstances may conduce to the growth of this weed, so annoying to the cultivator; but I rather incline to the opinion that it is to the phosphate of lime contained in the ordinary dressings of the land that we may to a considerable extent attribute the advent of this unwelcome visitor. It is certain that couch needs a copious supply of this salt for its healthy growth; for when the ashes of this plant were analyzed by Mr. Kensington they were found to contain more than one-fifth of their weight of phosphate of lime (*Jour. Roy. Ag. Soc.*, vol. xviii, p. 352). It was when observing upon the result of this analysis that Professor Voelcker made the following rather amusing remarks: "The large proportion of phosphoric acid in couch ash deserves to be specially noticed. United with lime we have no less than 20 per cent. of bone earth in couch ash—a circumstance which throws some light on the experience of many Gloucestershire farmers, with whom I have conversed on this subject, and by whom I am told that the fouler the land is, the better will be the crop of turnips grown without any manure upon land simply pared and burned. I remember having walked once over a very foul piece of land full of couch, and was not a little amused by the remark of my agricultural friend who accompanied me. 'What fine healthy couch, sir! and will give me next year, I don't doubt, a splendid crop of roots, although I do not mean to put a single load of manure on this land.' Considering the large amount of couch which is sometimes collected from fields, and burned along with other vegetable remains containing phosphoric acid, a very considerable dressing of bone material must be given to the turnip crop in couch ashes. Indeed I have ascertained that a much larger proportion of bone earth is brought within reach of the turnip land in the red ashes obtained on paring and burning, than is contained in a heavy dressing of bone dust."

I need hardly enlarge upon the importance to our live stock of encouraging the growth of the best kinds of grasses, although it is true that the nutritive value of the natural grasses which tenant our pastures differs far more widely than is commonly supposed. Prof. Way long since showed (*Jour. Roy. Ag. Soc.*, vol. xiv, p. 181), that the different principles contained in the natural pasture grasses of our fields varied largely in amount. 100 parts containing after being dried in a temperature of 212 deg.—

	Lowest.	Highest.	Average.
Flesh forming principles	6.08	17.29	10.98
Fat producing	2.11	8.67	3.08
Heat giving	38.03	57.82	45.57

Professor Voelcker (*Quar. Jour. Agri.*, 1853, p. 385), pursuing the same course of examination, comparing the nutritive value of several of the grasses with that of other green food, he obtained the following results, which I give in a tabular form. In the following table column I. gives the substance examined in its green state; II., the per centage of water; III., the nitrogenised organic matter capable of producing flesh; IV., the substances not con-

taining nitrogen, and fitted for the support of animal heat and for laying on fat, V., the inorganic matters or ash. All the plants examined were grown in separate beds on the same ground. The leaves of swedes, turnips, and mangolds were analysed in November, the cabbage and cauliflower in October, the other plants in August and September, when they were just come into flower:—

I.	II.	III.	IV.	V.
Red clover ...	80.64	8.60	18.78	1.97
White or Dutch clover ...	83.65	4.52	10.26	1.57
Yellow clover (<i>M. cupulina</i>) ...	77.57	4.48	15.94	2.0
Alsike clover (<i>T. hybridum</i>) ...	76.77	4.82	16.44	2.06
Bokara clover (<i>Melilotus</i>) ...	81.30	3.88	13.52	1.89
Lacern ...	73.41	4.40	19.11	3.08
Sainfoin ...	77.32	3.51	17.43	1.73
Vetches ...	82.16	3.56	12.74	1.54
Italian rye grass ...	80.77	2.86	14.38	1.98
Rape ...	87.05	2.76	8.57	1.61
Cauliflower ...	88.60	3.54	6.70	0.83
Cabbage ...	86.28	4.75	7.10	1.87
Mangold leaves ...	91.96	1.76	4.98	1.29
Leaves of swedes ...	81.36	2.08	7.25	2.29
Turnip do. (Norfolk ball) ...	91.28	2.45	4.74	1.52
White Belgian carrot ...	88.06	0.596	10.184	0.74
Parsnips ...	81.78	1.310	15.96	0.941

Before we proceed to examine the effect of different artificial dressings upon the natural pasture grasses, we may with advantage follow Professor Buckman in his examination of these. The Professor has given (*Jour. Roy. Ag. Soc.*, vol. xv., p. 462) the proportional number of the grasses which commonly tenant grass lands on different soils. In the following table column I. gives the trivial name; II., the proportional number of plants on upland pastures, thin soils; III., on poor clay; IV., on rich loam; V., on flooded meadows; VI., on irrigated meadows:—

I.	II.	III.	IV.	V.	VI.
Meadow foxtail ...	0	1	2	2	3
Timothy grass ...	—	1	2	1	2
Marsh bent ...	2	—	—	1	2
Oat-like grass ...	—	2	1	—	—
Field meadow-grass ...	1	1	2	1	3
Roughish meadow grass ...	—	—	—	2	1
Quaking grass ...	1	2	—	—	—
Soft oat grass ...	1	—	1	1	1
Yellow oat grass ...	—	—	1	1	2
Narrow-leaved oat grass ...	1	2	—	—	—
Meadow soft grass ...	1	1	—	2	—
Sheep's fescue ...	4	—	—	—	—
Hard fescue ...	2	1	1	—	1
Creeping fescue ...	—	—	2	—	—
Meadow fescue ...	—	—	2	1	1
Spiked fescue ...	—	—	2	1	1
Upright brome grass ...	1	—	—	—	—
Cocksfoot grass ...	—	1	2	3	3
Field barley grass ...	1	1	2	2	2
Perennial rye grass ...	1	1	3	2	2
Average amount of hay per acre in cwt. ...	—	10	15	25	30 to 40
Do. rent in shillings ...	10	15	25	30	40 to 100

The next very important branch of our inquiry relates to the effect of the long-continued application of certain manures upon the different kind of natural grasses. Now, this research has been instituted, and for several years carried on, at Rothamsted, in Hertfordshire, by Mr. J. B. Lawes and Dr. Gilbert. They selected six acres of the Park at that place, which had been under permanent grass for certainly more than a century. The land is a somewhat heavy loam, with a red clay subsoil resting upon chalk, and very well naturally drained. The area was

perfectly level. During the experiments, nor for many years previously, were any seeds sown. The experiments were conducted on plots of half an acre each. The plots were thus manured in 1856, and the dressings have been annually repeated since.

The average annual produce of hay during the first three years, 1856-57-58, was in tons and hundred weights per acre, as follows:—

1.—Unmanured ...	1	8
2.—Unmanured (duplicate plot at the further end of the series) ...	1	4
3.—2,000 lbs. sawdust ...	1	0
4.—200 lbs. each sulphate and muriate ammonia (good samples of the salts so named in commerce) ...	1	15
5.—2,000 lbs. sawdust, and 200 lbs. each sulphate and muriate ammonia ...	1	15
6.—275 lbs. nitrate of soda (one year) ...	1	11
7.—550 lbs. nitrate of soda (equal in nitrogen to the ammoniacal salts of plot 4) (one year) ...	1	11
8.—Mixed mineral manure, composed of superphosphate of lime: 200 lbs. bone ash ... 150 lbs. sulphuric acid ... 800 lbs. sulphate of potash ... 200 lbs. sulphate of soda ... 100 lbs. sulphate of magnesia ...	1	13
9.—Mixed mineral manure, as plot 8, and 2,000 lbs. sawdust ...	1	15
10.—Mixed mineral manure, as plot 8, and 200 lbs. each sulphate and muriate ammonia ...	2	10
11.—Mixed mineral manure, as plot 8, 200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. sawdust ...	2	18
12.—Mixed mineral manure, as plot 8, 200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. cut wheat straw ...	2	14
13.—Mixed mineral manure, as plot 8, and 400 lbs. each sulphate and muriate ammonia ...	3	3
14.—Mixed mineral manure, as plot 8, and 275 lbs. nitrate of soda (one year) ...	1	17
15.—Mixed mineral manure, as plot 8, and 550 lbs. nitrate of soda, equal in nitrogen to the ammoniacal salts of plot 4, 10, &c. (one year) ...	2	10
16.—14 tons farm-yard dung ...	2	0
17.—14 tons farm-yard dung, with 100 lbs. each sulphate and muriate ammonia ...	2	8

The general results of the trials during six seasons are summed up by the authors of this important inquiry (*ibid.*, vol. xxiv., p. 161), which I give chiefly in their own words:—

So far as the general distribution of graminaceous, leguminous, and weedy herbage, and the tendency to the production of leafy or stemmy produce, and to early or retarded ripening are concerned, the characters of the produce of the seventh season of the experiments (1862) are, in the main, similar to those of the produce of the third season, 1858; but there is considerable change in the relative predominance of certain species on particular plots. *Dactylis glomerata*, *Festuca duriuscula* or *F. pratensis*, *Avena pubescens* or *A. flavescens*, *Poa trivialis* or *P. pratensis*, and *Alopecurus pratensis*, have, respectively, become much more prevalent on one or more of the plots, according to the description of manure employed.

"The unmanured produce consisted of 74 per cent. graminaceous, 7 per cent. leguminous, and 19 per cent. weedy herbage. It showed great variety, and comparatively little predominance of individual species. *Festuca duriuscula* and *F. pratensis*, and *Avena pubescens* and *A. flavescens*, were the most prominent; whilst the freer-growing grasses were in smaller amount, and a number of others in

less proportion still. The crop was even, but very short, and with little development of stem; and it was green, and comparatively late, at the time of cutting.

"*Mixed mineral manures alone* gave comparatively little increase of graminaceous herbage, and reduced the proportion in the produce, both of it and the weedy herbage; but they greatly increased both the amount per acre, and the proportion, of the leguminous plants, *Trifolium*, *Lathyrus*, and *Lotus*. The description of the graminaceous herbage was not very much altered from that of the unmanured land; there was no striking predominance of individual species, but, compared with the produce by more productive manures, a pretty even mixture of most of the grasses occurring without manure, and those which did show any prominence were chiefly of the smaller and less free-growing kinds. The tendency to form stem and seed, and to early ripeness, was much greater than without manure.

"*Ammonia-salts alone* considerably increased both the amount and proportion of the graminaceous herbage, almost excluded leguminous plants, and generally reduced the number and amount of miscellaneous or weedy species, but much increased the luxuriance of some, particularly *Rumex acetosa*, *Carum Carui*, and *Achillea millefolium*. The relation to one another of the graminaceous species, as to amount, was much the same as without manure, excepting that *Festuca duriuscula* and *Agrostis vulgaris* were brought into much greater prominence. The increased growth was characteristically that of root or base-leaves, and there was very little tendency to form stem or to ripen.

"*Nitrate of soda alone*, like ammonia-salts alone, considerably increased the produce of graminaceous herbage, and tended chiefly to the production of root-foliage. The nitrate, however, strikingly brought into prominence the *Alopecurus pratensis*, at the expense, compared with the produce by ammonia-salts, chiefly of *Agrostis vulgaris*, and partly of *Festuca duriuscula*. Otherwise, the distribution of species was not very materially altered, the more luxuriantly-growing grasses not being much developed. The crop was much more leafy than stemmy, very dark green, and late; contained very little leguminous herbage, though rather more than the produce by ammonia-salts alone; and the weedy plants were luxuriant rather than numerous—*Plantago lanceolata*, *Centaurea nigra*, *Rumex acetosa*, *Achillea millefolium*, *Ranunculus*, and *Taraxacum*, all being more or less encouraged.

"*The combinations of nitrogenous manure* (ammonia-salts or nitrates) and *mixed mineral manures* gave by far the largest crops, the largest proportion of graminaceous herbage, the largest proportion referable to a few species, scarcely a trace of leguminous plants, and a small proportion both in number and amount of miscellaneous or weedy ones. The produce was very luxuriant, with a great development of stem and stem leaves, and a much greater tendency to ripen than when the ammonia-salts or nitrates were used without the mineral manure. The predominating grasses were the most bulky and free-growing ones; *Dactylis glomerata*, and *Poa trivialis*, being very prominent; and *Avena pubescens* or *A. flavescens*, *Agrostis vulgaris*, *Lolium perenne*, and *Holcus lanatus*, somewhat so. *Festuca duriuscula*, *F. pratensis*, *Arrhenatherum avenaceum*, *Alopecurus pratensis*, *Bromus mollis*, and others, were almost excluded.

"*Farmyard manure* considerably increased the growth of the grasses and of some few weeds, particularly *Rumex*, *Ranunculus*, *Carum*, and *Achillea*, and reduced that of clover and allied plants, more especially when used in combination with ammonia-salts. It greatly encouraged the growth of the good grass *Poa trivialis*, and of the bad one *Bromus mollis*, and, when in conjunction with ammonia-salts, the *Dactylis glomerata*. Under both conditions

Festuca duriuscula and *F. pratensis* were nearly excluded, and *Avena flavescens*, *A. pubescens*, *Agrostis vulgaris*, *Lolium perenne*, and *Arrhenatherum avenaceum*, were very much reduced. The crops were upon the whole bulky, comparatively simple as to description of herbage, fairly luxuriant both in stem and leaf, somewhat rough and coarse, and showing a tendency to unequal ripeness.

"*Leguminous herbage* was almost entirely excluded whenever nitrogenous manures were used in any quantity, whether in the form of ammonia-salts or nitrates, alone or in combination with mineral manures; but it was somewhat less so with the nitrate than with the ammonia-salts. Mineral manure alone, containing both potash and phosphoric acid, greatly increased the growth of the leguminous plants perennial-red-clover and meadow-vetchling. Farmyard manure, like artificial nitrogenous manures, also, but in a less degree, much diminished the proportion of the leguminous herbage.

"Every description of manure diminished the number of species, and the frequency of occurrence, of the *miscellaneous or weedy herbage*; mineral manures alone less so than any other; nitrogenous ones, especially in combination with mineral constituents, did so very strikingly, but they at the same time greatly increased the luxuriance of a few species, especially *Rumex acetosa*, and frequently *Carum Carui* and *Achillea millefolium*. *Plantago* and *Ranunculus* were generally discouraged by active manures, excepting farmyard-manure and nitrate of soda. The nitrate also favoured *Centaurea nigra* and *Taraxacum dens-leonis*.

"Considerable increase of produce was only obtained by means of farmyard-manure, or artificial manures containing both mineral constituents and ammonia-salts or nitrates. The crops so obtained were much more graminaceous, and consisted, in much greater proportion, of but a few species of plants. The grasses developed were chiefly of the more bulky and free-growing kinds, and the produce was generally very stemmy—being the more so, and the coarser, the more excessive the manuring.

"Meadow-land mown for hay should not be manured exclusively with artificial manures, but should receive a dressing of well-rotted farmyard dung every four or five years.

"Sewage irrigation, like active manures applied to meadow-land in the ordinary way, has also a tendency to develop chiefly the graminaceous herbage, excluding the leguminous, and to a great extent the miscellaneous or weedy plants. It also, at the expense of the rest, encourages a few free-growing grasses, among which, according to locality and other circumstances, *Poa trivialis*, *Triticum repens*, *Dactylis glomerata*, *Holcus lanatus*, and *Lolium perenne* have been observed to be very prominent. The result is an almost exclusively graminaceous and very simple herbage. But, as the produce of sewage-irrigated meadows is generally cut in a very young and succulent condition, the tendency which the great luxuriance of a few very free-growing grasses has to give a coarse and stemmy later growth is less objectionable than in the case of meadows left for hay."

To the scientific and practical agriculturist I need not enlarge upon the value of researches so important as these. It is indeed only by carefully watching the suggestions of nature, and of accidental interferences with her operations, that most of our agricultural improvements have arisen. It was in this way that the value of bones was first brought to the notice of the Cheshire farmers for their grass lands, and led to their employment in the drill for the turnip soils of Lincolnshire. It is true, that it was a celebrated German chemist, Liebig (whose services to agriculture have never yet been fairly regarded), to whom the introduction of superphosphate of lime is owing; but he would not have thought of suggesting the use of this invaluable salt as a fertilizer, if the English farmers had

not long before, by chance, discovered the value of phosphate of lime in crushed bones. It was a similar chance observation which led to the employment of the crag and the sea-shore sand as manures, by the Suffolk and Cornish farmers. Science has since explained the action of these

different fertilizers, and it will be happy for our country if the farmer and the chemist long continue side by side, to watch dame Nature's movements, patiently note her suggestions, and verify and carry out what she vouchsafes to bestow upon us.

THE HERDS OF GREAT BRITAIN.

CHAPTER XL.

THE LEEN HERD.

"My way to Ludlow," says Edward Irving, when broken in health and heart, he took his last English ride, "lay over the ridge which joins the two clay (Clea) mountains; and as they rose before me, in their blue and naked majesty, out of the ripe vegetation, and abundant wood, it seemed to me as if I had never seen the beauty and fatness of the land till now." Thus too would less sympathetic pilgrims have mused, if they had caught their first glimpse of Herefordshire in the Ledbury district, and steadily worked on towards Westonbury and The Leen. Do you desire perry, you have the "champagne quality" at hand, from the Oldfield, Swash, or Moorcroft sorts, and medicinal aid from the Barland, growing on trees, not so big, it is true, as the Holme Lacey one, which tradition spreads over two acres, and which is good yet for us 1600 gallons, but still very banyans for size and shade. Tarrington station finds you in the very centre of Lady Emily Foley's domain, and the neatly-trimmed hedges and rich tilth, as far as eye can reach, prove that the tenant of Showle Court had no May-day task to win her ladyship's prize. Here too the spacious hop yards of Herefordshire come fast and thick, but the numberless poles unpalled told too plainly of summer promises blighted.

The Hereford race-course is on our right as we desert the steam-horse for a sober gig, and as we trot past it, we may well look forward, with city and county, to the day when it will be devoted to nobler victories than Shepherdess's and Pinkepo's, when the hedges are levelled on its fifty acres, and the cathedral bells ring out their welcome to a July Meeting of the Royal. Pownhope and its carbonaceous limestone hills are dear to every Herefordshire and English geologist, as the scene of Sir Roderick Murchison's first studio, where he wrote his Silurian system; and we should have lent a very dull ear indeed to our cicero, if we had not learnt much of the county beef system for 70 years past in that pleasant twelve miles drive to Pembridge. We broke ground with Breinton, once the abode of the owner of the celebrated "Short-tail Cow." Then came Huntington Court, where Tully and his greys flourished, when the century was young, and had no firmer adherents than the Turners of The Noake and Jeffries of The Grove.

Burton Court gathers more recent laurels as the home of Davis's Courtier, one of Edward Price's breeding, and second to The Prince Consort's Maximus, at Battersea. Vern House recalls how the Haver family have "gone for white-faces for 100 years," and how Sovereign, the sire of Cotmore, laid a foundation which has placed them in the front rank of the bull breeders to this day; while beneath the shadow of Robin Hood's Butts lies Wellington, that stronghold of the mottled faces, where old Silver proved himself such sterling coin. It was at King's Pyon that the Misses Tomkins kept up their family herd with quite a lady Pigot's ardour; and Peploe of Garnstone (one of the best landlords in the county), with all a neighbour's loyalty, still goes for their good old blood. Pitts of

Chadnor strikes familiarly on the ear in connection with Christmas prize cows, and the bull Northampton; and ere we have time to look at Brierley Hill, and think how many "noses" it will add to the kennel door, we are over the far-famed Stretford Bridge. But a truce to hound and horn, and the coalition cabinet of Cornwall and Arkwright, to which this bridge is a very Downing Street.

Stretford Court and its Taylor's "Fancy Leominster" is on the one side; and the thoughts of Vever's victorious Battersea, by Corn Exchange from Pigeon, and Roberts's cow, which swept all the county fat honours in '61, and made good her right to them at Smithfield and Birmingham, lend double dignity to Ivington pastures, on the other. Cholstrey parish can boast of Thomas, the breeder of Lord Berwick's Tom Thumb and Mr. Monkhouse's Severn; and of Perry, faithful as ever to the Goldfinder blood, which came from John Turner of The Noake. Pure Jeffreys blood and Quicksilver are synonymous with John Carpenter and the homestead at Eardisland; and it was at Croft Castle that Vever's old Croft was bred. Lynch Court, now occupied by W. D. Turner, the breeder of Logic, was known in years gone by, as "Smythies of The Lynch." He was rector of Colchester, it is true, but still he lived, no Bishop Wigram forbidding him, to write what his keen intelligence had taught him about his breed with the spotted faces and grey and white backs, and to verify his practice in the show yards as well. Many and warm were the arguments he used to prove their superiority over all others, not the least of which was his unaccepted challenge to show a hundred of them against the same number of any other breed in the kingdom, for £100. Shobdon, once the home of the bull Carlisle, lies embowered among the wooded heights, across the Valley of the Lugg; but we have no time to step aside from our route, and we pin our sturdy faith to Irving's tale of a Sunday spent in its little inn, that it is, or was in '32, "a beautiful village, clothed with ivy and roses."

And so we reach Pembridge at last, which has bestowed its own name on the bull by Sir David, the best home-bred one in the Court House herd, to which Perry's Goldfinder 2nd and Yeld's Magnet have brought no mean strength. In its way it is rather a remarkable little place. Its steeple, like those of Cusworth and Kirkoswald, is separate from its church—but there it is; whereas it had once a dean, but of him we can find no trace. We are soon through its main street, with its quaint gable ends, and Cheshire cross garters, and over the Arrow—whose otters, like their brother-fishers on the Lugg, had good reason to remember the Duke of Beaufort's sallies (when Marquis of Worcester), with spear and hound, from Troy House, and know no rest now from the Hon. Rowland Hill—and we are at Philip Turner's of The Leen at last.

This herd is of no modern date. In 1780, the grandfather of the present owner took to the stock and the unexpired lease of Mr. Preece, at Aymstrey Court; and in

1803 he issued his challenge to show his six-year-old ox against any breed in the world, for 100 gs. a-side, "to weigh the heaviest, and have least coarse meat." The challenge was not accepted, and the ox went to the butcher the next year, and was sold by retail for £81 9s. 4d. It averaged 24 score 8 lbs. a quarter, its tongue made 10s. 6d., and its marrowbone weighed 16 lbs. Mr. Turner's father commenced in 1810, and crossed Knight of Downton's greys with Edward Jeffreys' mottle faces. He had also an intermixture of Tully blood, and a good many from his brother Mr. John Turner, of The Noake, as well as Mr. Jones, of Breinton, and Mr. Parry, of Old Court. His son's first essay as a breeder was at West Hyde, in 1889, when Mr. Kedward sold off; and two cows, Moreton and Nonce, from that stock, and twelve cows from Aymstrey, started the herd. With the latter came Lottery 2nd, which was bred by his uncle, and did the Aymstrey herd no small service as a heifer-getter, and also took his part as one of the winning trio of the bull, cow, and offspring prize at Hereford in '41. Two yearling bulls by him were the first that Mr. Turner ever bred or exhibited; and before they went into the yard at Hereford, two breeders gave him 100 gs. for the pair, and the winner of the toss for choice, before the awards were given, chose the one which did not get the prize. Commerce (354), own brother to Quicksilver, a pure Jeffreys bull, and Viscount (816), own brother to Lord Berwick's Victoria, were both hired from Mr. Carpenter; but it is to Sir Walter (352), a purchase from the same herd, that Mr. Turner owes some of his best females, and seven of them, in 1857, at Hereford, won the first prize of that kind the Society ever gave. He also dipped into The Knight when he was at The Noake, and his son Andrew 2nd, one of whose daughters produced Pilot by Sir David.

The purchase of Silurian (1064) from Mr. Rea, as a yearling, proved a lucky one, and after two years' service (with Tom of Lincoln as his aid-de-camp), during which he got a Royal second, and a number of thick but small heifers, he departed to Australia at 140 gs. Among other sales may be noted, a bull to Germany, four cows in 1849 to Mons. St. Marie, and a few to Australia; but Mr. Turner's has been rather a home trade. Sir David's return from Scotland to The Noake tempted him to make a bold stroke for a bull, and he accordingly purchased Gaudy by Defiance (1209), then in her fifteenth year, from his brother-in-law, Mr. Childe, of Wigmore Grange, and the result was Felix. The old cow followed suit with Comely, Ursula, and Bertram, and the latter by Wellington (a bull of his own Sir Walter and Moreton strain), did as good service at The Leen as his half-brother. The Sir David blood was Mr. Turner's aim, and his last bull purchase was Bolingbroke, by Sir Benjamin, from Damsel, of the Jeffreys' blood, and bred by Mr. Rogers, of The Grove. His career as a shower at the Royal opened at Windsor, and both in that arena and the three great county ones of Hereford, Ludlow, and Leominster, he has had his full share of good things. He has been three times an exhibitor at the Smithfield Club, and taken two firsts; and a first with Novice, and a second with Countess, stand to his credit at Bingley Hall. The latter cow has so far been his best performer, as, although she inherited the Silurian lack of scale, she added to her Christmas first and second a first prize and gold medal at Poissy, and stood second in the cow class at Leeds, where Ruby was first as a heifer in-calf.

The Leen, on which Mr. Turner entered in 1845, is a farm of 336 acres, of which all, save twelve of Mr. King King's, belong to Mr. Evelyn, of Coiton. Two hundred acres of it are in grass, and the rest in hop-yards and tillage. It is on a rich alluvial loam, well adapted for roots, more especially swedes, but rather too strong for straw. The herd numbers about 180 head, and the calves about thirty a year. With the exception of two

or three from each fall, very few cows are kept beyond five years. The bullocks generally go off soon after two years old, and the last lot by Silurian left £1 behind them for each month of the twenty-five with only grass feeding. The calves are with the cows for six months, and the bullocks tread straw, and eat turnips cut and pulped all the winter. It is on the Sir David blood, with their grand character, wide backs, and good quality of flesh, that Mr. Turner relies; and he has a double cross of it with Bolingbroke on the Felix cows. In his case it is merely falling back on the family blood at The Noake, as the dam of Chance, which was of the same blood as the Short Tail Cow, was sold from there in-calf of him to Mr. Williams, of Newton, in Breconshire, and Chance was the sire of Sir David. With the Short Tail Cow Mr. Turner's blood is further connected through a few calves from a daughter of her's, which was purchased by Mr. Turner, of The Noake, at the West Hyde sale. She was put to Sir Walter, and the produce Waverley was the sire of Mr. Turner of Lynch Court's Garland, the dam of Logic, who was the sire of Percy.

The Sir David blood was the first to meet our eye in the Ox Pasture in the shape of *Katharina* by Felix from Duchess, a neat compact heifer. Felix had, like Bertram, two seasons in this herd, and was then slaughtered. *Dorcas*, a long low cow, was by Tom of Lincoln. She has had an immunity from drafting, and is now the matron of the herd with four calves, and in-calf to Bolingbroke again. *Jewel*, a twin along with Amethyst from *Brilliant*, was a wide and short-legged cow with plenty of character, and hocks well under her, and testifying in her dark colour to her Felix get. *Bessy*, the first from Comely, told also of her Silurian origin with her long and broad head; and there too was her sister Nell by Silurian from a Sir David, grandam Nell Gwynne, the first cow at Lincoln. Lelia, half-sister to Countess, joined the party in which the light-coloured Fairmaid, Juliet a very good one with a white mane and much of Sir David character, and Ariel, probably bound like her for Worcester, completed a good Felix quintet.

The Ox Pasture Plock, as they call it in these parts, contained a neat but small half-sister to Ruby. There too was a yearling daughter of Woodbine, and the first scion of the Bertrams, a good heifer from Stella, and some younger ones by Logic. Ruby's box in the yard was vacant: she had been put up to fat the year after her Leeds victory, but a severe bearing down came on, and she had to be slaughtered. Ursula by Sir David from Gaudy was now in possession, and in-calf to Shylock, and ripening gradually with her Bolingbroke calf Rosaline for Worcester. She has quite the Sir David head and marks. Her old dam Gaudy was slaughtered at nineteen, after breeding six, one of which was made a steer. Two steers of Bertram blood were in the boxes, and promised well for Christmas. The nice quarters and outline of Bolingbroke, a Sir Benjamin, bred by Mr. Rogers of The Grove, were our next attraction, with his son Falstaff from Daisy in the adjoining box; and there we found Comely by Young Confidence, already a tight fit for the door of the house, which Countess occupied before her. She has not the forequarter of Countess, but she is on a greater scale, and when she is thoroughly made up for next Christmas, she will exceed her 66½ score. Her grandsire Confidence fetched 100 gs. at Mr. Jeffrey's sale, and she hastened to multiply the sort by breeding Bessy by Silurian at two years old. Since then she has had four calves, and was never shown except as a cow in milk at Hereford in 1861, and again among the extra stock there last year. Percy by Logic is her principal produce. He has met Batterssea thrice; but at Hereford, the royal bull, won the rubber, and Percy was then sold to Mr. Downes of Maesmore, Breconshire.

On our way to the Bolingbroke calves in the orchard we pause over the heap of "wooden bottells" which are tossed down after the day's labour at the door of the cyder-house. They are two-quart ones: but the season of harvest is not yet, and then the labourer's powers of cyder suction border on the fabulous. They have their option of eleven shillings a-week without or nine shillings with cyder, and invariably choose the latter. Seventy casks of 100 gallons, three years ago, was Mr. Turner's greatest crop; but to a "mere beer-drinking Saxon's" eye, it seemed marvellous to find six five-hundred gallon casks in a row, and tapering gradually off to three, two, one. The floor was strewn with rushes for tying hop-bines. The onthouse-fires were out, so that conveyed no image to our mind; but a party were hard at work sharpening hop-poles, on our way to the orchard, which was full of young trees, well lined against the teeth onslaughts of rabbits, mice, and cattle; and patriachs grafted with table fruit. Since the disappearance of Carlisle and Keswick Codlins, which it was considered sacrilege to slice or peel before they were put into a pie, we have disbelieved in all apple science. It is said, however, to be reviving; and Praiesworth, Hawthorden, Yellow In-

gestre, Wills's Favourite, Prince's Pippin, Wellington, Tilpey Seedling, and Kerry Pippin, are big with suggestion to a cyder mind, and the forthcoming Royal essay may tell us more of the properties of the Transparent Codlin, or confirm the floating notion that the Blofeld Seedling is "an excellent dessert apple till March." The beheaded pear-trees were also rich with grafts. "Mr. Knight of Downton Castle's" name blossomed again in "Knight of Downton" and "Knight's Monarch," and Green Sovereign shared the grafts with Beurre d'Aumailis and Winter Nelis. Normandy is furnishing new stocks; but if the Herefordshire peasant does get through Easter Henry, the pronunciation of Josephine de Malanle will bring his tongue to grief. Fourteen weaned Bolingbrokes had the full run of the orchard, among which those from Ruby, Gayluss, and Dorcas more especially caught our eye; while ten two-year old steers, nine of them by Bertram and one of them from a last relic of old Gaudy, ranged in The Hams, on the banks of the Arrow, that haunt of the trout and grayling, whose stream we followed for a space on our way to Westonbury.

H. H. D.

THE BISHOP, THE CLERGY, AND THE FARMERS.

There is a story now going the rounds of society so utterly monstrous as but for a recently published correspondence to be almost incredible. Authenticated, however, as the facts are, we hold it to be a duty to place them before our readers; while in doing so we shall adopt, so far as is possible, the very words of the chief actors on the scene. It appears, then, that the Reverend George J. Davies, who had long been the minister of a parish in Essex, determined from ill health to retire to a farm, with the hope that by fresh air and out-door exercise he might restore a constitution enfeebled by too close application, as perhaps, from having never been absent a single Sunday during eleven years of parochial charge. At the same time Mr. Davies informed the Bishop of the diocese that it was his intention to assist his neighbours occasionally, though he refused all offers which would put on him the responsibility of any weekly duty. Further than this, being on terms of intimacy with Mr. Disney, the Squire of the parish in which he had officiated, and under whom he rented, Mr. Davies undertook to manage his friend's farm as well as his own, and to co-operate with his landlord in seeing that the families of the labourers were properly cared for. This state of things appears to have gone on for some considerable time, the Bishop of Rochester having been advised in the onset as to the change of life which Mr. Davies' health had necessitated. Unfortunately, however, the latter had taken the wrong path, as the following extraordinary letter will show:—"Danebury, Jan. 10, 1868. My dear Sir, I have been informed from time to time, for a good while, that you officiate in various parishes around Ingatestone, by assisting the clergy when absent from their cures and otherwise. And it appears to be generally known, and much remarked on, that you are engaged in the management of land, holding a farm also yourself, and of necessity associating with farmers and markets far more than is usual in the case of clergymen, or than is proper for them, according to the best judgment I can form. You are not licensed; and I must therefore request that you will henceforth desist from officiating in any of the churches which come under my jurisdiction. Old acquaintance makes me regret the necessity for this interference; but my duty to the diocese, after the inquiry I have made,

renders the act imperative. I remain, my dear sir, yours faithfully, J. C. ROCHESTER." There are four distinct charges here, all taken, be it borne in mind, as proven, before the offender has the opportunity of offering a word in his own defence:—first, That Mr. Davies was engaged in the management of land—second, that he held a farm himself—third, that he associated with farmers; and fourth, that he associated with markets—whatever this last indictment may happen to mean, when only duly lowered to the comprehension of common minds, from the elegant English of the Bishop of Rochester. The several answers have to some extent been already implied in the development of the story. Mr. Davies' connection with Mr. Disney arose from there being no farm-house on the land the former occupied, while the Squire offered him the use of one, so that these old acquaintance might still be neighbours; and hence the offer, in return, of a comparatively idle man to look after his friend's farm as well as his own. He engaged in the pursuits of agriculture on his own account only when his health would not permit of his continuing his duties as a clergyman, and with the not unnatural hope that such a means of employing his time, combined with fresh air and out-door exercise, might restore his constitution. Could any physician in London have given better advice? But unhappily Mr. Davies forgot himself and his original position when once embarked on the business of this degrading occupation. He "associated more than is proper with farmers and markets." We picture him, in a moment, with a long clay pipe in his mouth, haggling and wrangling like another Trulliber over his pigs, or reeling home from the market ordinary, as is of course the custom with farmers in general. This apparently is the case, as the Bishop had it from the tale-bearers who adorn the diocese of Rochester; but what is the fact? "My grain and cattle, when sold in market, are sold by a commission agent, because I dislike that part of the work. I often ride into Chelmsford on market-days, and I have the friendship of many of the leading agriculturists of Essex; but my tastes have never led me into any low company, because I was born a gentleman before I was made a clergyman." This, though, may not be sufficient, and it may be perhaps as well to inquire into the culprit's actual

character and standing as a clergyman. It is thus the Rev. Andrew D. Staapole speaks to it, in a letter he addressed, with a feeling of "regret and astonishment," to his bishop: "I have known Mr. Davies from a boy. He was a pupil of mine at Winchester, and he is well known to the church at large by his literary labours, especially those 'Papers on Preaching, by a Wykehamist.' In whatever parishes he has officiated, he has left manifest traces of his zeal and earnestness, in schools built and churches restored, and in his present home his influence is exerted in every way for the good of those around him. I am induced to venture on this application because, in 1861, Mr. Davies acted as my temporary curate during my severe illness; and I will undertake that every man in this parish shall testify to the efficiency with which he performed the duties. On Sunday last my churchwarden, when he heard of this astonishing circumstance, said to me, 'I am surprised, for Mr. Davies is a very able man.' I believe that I could not have better pleased my parishioners if I had been able to offer, and he to accept, my permanent curacy. It was well known to your lordship that he did so act, and had it then been an injustice to the diocese, I presume that I should have had some intimation to this effect." Much of this, however, could not have been new to the bishop, who addressed the man, whose prospects in life were at stake, as an old friend, and who, when preparing his Charge on "How to preach," to the clergy of Hampshire, had actually requested the loan of these "Papers on Preaching," while they were yet in manuscript, of his old acquaintance! Well indeed, then, may Mr. Davies say, in return, "I feel if friendship has any ties, your lordship might the more readily have asked me to visit you, and have pointed out to me in what I was acting unadvisedly." But, instead of this, the old friend and the good bishop at once adopted the accusations of persons whose names he declined to give up, but some of whom are gravely assumed to have been on the Board to which the holy man wished to refer the correspondence. Mr. Davies treated this offer with quiet contempt, and in preference referred the whole correspondence, as now

embodied in a small pamphlet, to the world at large. We scarcely dare trust ourselves to speak on this, or the fallen state of a clergyman who has been convicted of taking to agriculture for the benefit of a broken constitution, and who not only associates with farmers, but who absolutely boasts of having the friendship of many leading agriculturists! We may still allow this miserable sinner to say a word or two for himself, as he pleads to his old friend and good bishop in this wise:—"As your Lordship has debarred your clergy from field sports and out-door amusements, there is only agriculture in which a man may seek for recreation. I have read as much as most men, but I never yet met with a passage in any writer, sacred or profane, in which agriculture is supposed to be a hindrance to the development of man's higher nature and nobler feelings. The Church, by assigning glebe, of great extent in some instances, recognizes even in her employed members the fact that farming is not unclerical. Mr. Huxtable's appointment last year to the Archdeaconry of Dorset was well received by the Church, and Mr. Huxtable is one of the giants of agriculture. Many clergy farm more thousands than I do hundreds of acres. The glebe at Danbury which the late Bishop was fond of showing to his clergy, and which I believe your lordship keeps in your own hands, is to the extent of three hundred acres. I have never associated with farmers in any other way than every Christian gentleman ought to associate with them. Your lordship will therefore excuse my protesting against my course having been unclerical. Having put the letters into a pamphlet for my own justification, I hope never to hear the subject mentioned again." The good bishop then positively holds a farm of three hundred acres in his own hands! but we do hope that he has not the friendship of any leading agriculturists, and that his lordship, at least, does not associate with farmers. And we shall certainly be curious to see how this pariah race will receive the toast of "The Bishop of the Diocese," at their orgies in Witham on Thursday, and whether any clergymen in the county will dare to dine with those outcasts, the farmers of Essex!

THE NORFOLK AGRICULTURAL ASSOCIATION.

MEETING AT YARMOUTH.

This association continues to break fresh ground with only still further success, and even so one-sided a site as Yarmouth results in the best agricultural meeting that the county has ever commanded. Not only was it the best show, but it was the best appreciated; as, despite a moist threatening morning, far more money was taken at the doors than on any previous anniversary. The society, moreover, was received with great spirit and liberality by the Mayor and his fellow-townsmen, a welcome in very striking contrast to the apathy with which the citizens of Norwich had come to regard their alternate visitation. The great doubt as to some exhibitors ever sending so far was very decisively settled, as there has seldom been a more even exhibition, made up as this mainly was from the immediate neighbourhood, if not exactly from Norfolk alone. Whether one turned to the cattle classes or the cart horses, or crossed through the barracks for a look at the sheep and pigs, they were pretty generally good; backed as these substantial features were by an admirable array of implements, which the very collections of such firms as those of the Garretts, Holmes, Crosskills, and others would go far to establish. It is wholesome to see that the prize sheet of the Norfolk Society is not confined

to the stock section; but that this speaks also to the presence of many well-known manufacturers, some of these, like Richmond and Chandler, from a distance, and others of equal eminence, like the Turners, nearer to the scene of action. It is perhaps prudent, with the one day or so show of a local association, to give the greatest encouragement to collections, as not necessitating any very elaborate trials, while such an offer prompts an exhibitor to make the most effective stand in his power. It will be found that no less than five entries of this description were duly recognized and rewarded by the judges, to whom the distribution of sundry silver medals for novelties or improvements was also confided. Prominent amongst these was Mr. Sainty's simple adaptation to the turnip-cutter, as a means for achieving the hitherto somewhat difficult accomplishment of cutting clean through to the last slice. Nothing could work better than this cheap and effective process, and nothing as a consequence took more with the practical men who witnessed it in action. It was with such visitors unquestionably the sensation of the mechanical section; while the general public stood in mute admiration to watch the course of Burrell's traction engine as it paraded the town, or went critically into the

merits of hay-makers and chaff-cutters. However the prize system may work elsewhere, it is evident enough that it infuses a deal of spirit into the implement business of the Norfolk Agricultural Association; and with numbers of good men still ready to go into competition, it would be hard to "ask or have" more.

Thanks to the Borough Members, who gave a cup for the best bull, and another for the best cow, and to the Mayor, who offered one on his account for the best horse, the premiums for stock were considerably augmented, and more in accordance with the character of an All-England meeting, such as the Norfolk now is. The cattle classes here are separated into Shorthorns, Devons, Polled, and "any other" breed; but of these the Devons are so rapidly declining, that it is a question whether they should still be recognized in the East with any individuality of their own, or rather be merged into the other sorts? More than half the premiums were withheld, either from a want of competition, or any entry whatever, and they are said to be even going out of fashion at Holkham. In fact, Mr. Blomfield and Mr. John Overman were the only exhibitors of the red Devons, the former winning with a neat level bull bred by Mr. Davy, of Flitton, and the latter with a pretty cow from the herd of Mr. Halse, either orthodox enough in any company. These little beauties, however, are becoming manifestly "ousted" by the cosmopolitan shorthorn and native polled beasts, both of which were in much force at Yarmouth. The show of shorthorn bulls was, indeed, demonstrative of considerable progression, whilst the awards went to confirm our impression at the time that the placing of this class at Dereham was "a bit of a scramble." Mr. Goulder's bull, for instance, a "very moderate" animal as we then pronounced him to be, was second last year, but nowhere now; whereas Lord Walsingham's white, "a clever youngster," at the previous meeting without any place, now deservedly succeeds to all the honours of the day. Still it is only fair to say that Lord Lovell has improved immensely, and is now a really grand bull, deep and square, with fine quality, as his pedigree from Mr. Sanday's herd should go to warrant. The Lincoln bull had a still better touch, but he was by no means true in his frame, and the second premium was accordingly claimed by Mr. Crisp for another white, with a capital back and great size and length, but not the bloodlike look, hair, or flesh of the other. There were no less than fifteen entered, nearly all of which were sent, Lady Pigot's manager again braving the public gaze with White Windsor, as he did in the next class with Pan, a lot over which the judges paused in some dismay, though they eventually selected a young healthy growing animal in fair condition as the best. This is Cockatoo, the property of Mr. Harvey, but bred at Branches, whence he was purchased at a very low figure; while Messrs. Badham and Ladds were gallant enough to compliment her Ladyship herself on the appearance of Pan, to which they awarded the second premium. Having so recently spoken to the merits of this extraordinary prize animal when exhibited at Exeter, we prefer that the *Norfolk Chronicle* should testify to his rank at Yarmouth: "What could induce the judges to pass over Mr. Burroughes' yearling, and place the second card over Lady Pigot's deformed and crippled animal? Never was there exhibited a more lamentable instance of the damaging results of over forcing. Here was a bull of eighteen months old, a mere shell of what he should be, with every joint misshapen, and exhibiting all the patchiness and helplessness of extreme old age. Mr. Burroughes' bull, on the contrary, was healthy and vigorous, with beautiful coat and first-rate quality of flesh, good along his loins, back, and chine, though somewhat small and short and plain and heavy about his shoulders."

There was no such difficulty in placing the Branches

entries for either the cow or heifer in-calf class, in the latter of which Princess of Edward had a walk-over; and in the former, Pride of Southwick was almost as easy a first as she was at Dereham last year, and at Exeter last week, and as she promises to be wherever she goes. Neither Mr. Crisp's nor Mr. Gooch's useful old cows had a chance with her, for style and quality; but Lord Walsingham was a better second amongst the yearlings, sending a deep, wealthy heifer that his lordship purchased on the break-up of the Bushey herd, and getting next-best with another, also of Mr. Marjoribanks' breeding. With Mr. Birch, Mr. Gooch, and Mr. Crisp also amongst the exhibitors, this was one of the best and most even classes in the yard, although with nothing of anything like equal excellence, for symmetry especially, to Lady Pigot's, who thus fairly swept the decks, the remarkable merit of her ladyship's females being only balanced by the quite as noticeable inferiority of her male animals. It is, in truth, really lamentable to see either of the bulls with which they have opened the season again before the public; and the sooner they are boiled down, the better for the credit of the herd they assume to represent.

The judges generally commended the class of polled bulls, as they might have done the whole entry of the sort without any very great impropriety; and the strength of the Norfolks and Suffolks here, as compared with their weakness at Dereham, was very striking. Lord Sondes' two cows were very happy illustrations of a breed that can milk and feed. With sweet heads and wild eyes, clean necks and deep carcasses, they have a deal of character that is surely worth cultivating; and we back Mr. Badham's suggestion that they should be as distinctly recognized at their own Norfolk and Suffolk shows as they are at the meetings of the Royal Agricultural Society or the Smithfield Club, where classes "proper" are devoted to their development. This is, moreover, being clearly carried out in Norfolk, where the level active bulls are not only commendable, or the cows and heifers worthy of their consorts, but where their uses are further pointed by their value on the butcher's block. Certainly one of the very cleverest animals here was Mr. Oliver's fat polled steer; of capital quality, evenly fed, long and deep, and well let down to his hook, nothing, so far, but a certain plainness behind can stay his owner from going-in for the Gold Medal at Christmas, when we shall most probably see the Yarmouth steer again. Mr. Carr would have winced a little had he seen his shorthorn Magnolia selected as the best cow of any other breed, as in the first instance she was; though, of course, a protest was entered, and the award corrected in favour of Mr. Henry Overman's useful Durham and Guernsey crosses, the judges declining to have anything to do with Mr. Sewell Read's good Welsh cows, which fared better at Battersea, where they were first and second! It is debatable, too, whether as a *breed* they had not greater claims to distinction in a breeding show than any cross-bred animals, however happy the nick over the first intention.

The honours of the sheep show were pretty equally divided between Lord Walsingham with the short-wools, and Mr. Brown of Marham with the long-wools. The best shearing Southdown was in many respects a wonderful animal, with fine symmetry, and great size and substance, but a bad dark-coloured head, that will lead him on to Hamburg instead of to Worcester. The old rams were not so good, even the winning sheep evincing a want of quality in their backs; whereas the single pen of Merton ewes were all five good, and the three lots of ewe lambs so equal in merit that it was only with some difficulty the judges could place them. Lord Sondes' pen of twenty ewes were another sorry, sizeable entry, shown in very fair order, and commendable for breed, mutton, and wool; but nothing told more upon Messrs. Fookes and

Rigden than Mr. Barratt's wether half-breds, by Lincoln rams out of Hampshire ewes. In a good class, full of commendations, these two first and second pens were declared to be very good indeed, and for weight and size they were at their age really extraordinary. Mr. Henry Overman, who has deserted the flock of his fore-fathers, was also in the ascendant with his cross-bred sheep, neither Southdowns, Leicesters, other long-wools, nor Oxfords, but with a deal of use about them, if not much distinctive character. The Leicester sheep, like the Hereford beast, has no place in Norfolk; but the other long-wools ran up to three very good classes, in which Mr. Sexton and Mr. Beale Browne pitted the Cotswold against the home breeds of Messrs. Tom Brown and Hugh Aylmer. But, as we have intimated, the award went all one way, notwithstanding that the two classes of rams were generally commended; Mr. Brown having the additional gratification of winning the cup for the best long-wool with a shearing ram—a clever, compact, springy sheep of more style than mere size. His aged rams, however, were grand enough for anything, and the best pen of ewes, with more breeding in their appearance, than we often find in the Norfolk long-wools. As Mr. Brown and Mr. Aylmer, we believe, exchange with each other, the pre-eminence of the two flocks at Yarmouth over other sheep from a distance speaks well for the sort, especially on the authority of judges who come respectively from Nottinghamshire and Lincolnshire. These gentlemen extended their range of duties to the pigs, where, if it be impossible to make even a breeding pig too fat, the section was a strong feature in the show, although some of these overdone animals were dead or dying in the yard. Amongst the large white the competition was confined to Messrs. Wainman and Crisp, with the former for preference; Mr. Crisp's big whites being by no means as good as his small blacks—one litter of which furnished here the two best boars, and another couple of highly commended sows. Messrs. Stearn and Sexton had to wait their turn amongst the younger pigs, the second prize sow of the former having been purchased at Mr. Barthropp's sale. Still, Norfolk has to travel elsewhere for a pig show, and there were very few entries made from within the county, and only one premium left in it, as gained by the Rev. T. L. Fellowes. The leopard, it is said, cannot change his spots, nor the Ethiop his skin; but there was a very evident effort here to rub out "the damned spot" from a white skin, with the yet more unsightly result of a sore back. Assuming that the pig did not object, the experiment was rather an amusing instance of the severe preparation that a show animal has occasionally to undergo.

However much Norfolk may be progressing in the way of polled cattle or long-woolled sheep, it is very certain that the district is still retrograding with regard to its once-famous breed of hacks. After no end of riding and walking and trotting, the judges withheld two of the premiums for hacks; while, with the exception of Mr. Kendle's stout little mare, the ponies had not much character; and Robin Hood, the first-prize hack stallion, would seem to be about the only horse of the old-fashioned Shales sort now in the county. The brood mares had no such redeemable feature from about home, the famous Yore, a winner by this time of eight-and-forty prizes, having been bought up in Yorkshire by Mr. Crisp; and the hunters, with the exception of Mr. Grout's second-prize mare, being an under-bred common-looking lot. Fortunately, however, the judges felt justified in generally commending the class of thorough-bred stallions—Young Joe Lovell, a colt with fine shoulders and good action, that won at Dereham last time, as he did here again; Eclairneur, a very neat, compact horse, over whose place against the chestnut the judges divided at Dereham; the north-county stallion, Mr. Stiggins', high on the leg and sleek in the

loin; and a three-year old, called Aconite, by Ambrose—all four now located in the county. Not so the prize-cup cart-horse, Mr. Badham's famous Emperor, who beat the Butley Conqueror fairly enough, but with nothing behind them, and the third prize withheld. The Emperors were altogether in great force, as Mr. Mumford's three-year old, a very handsome young horse, with a rare head and neck, but rather deficient in bone, is by the Bulmer sire, as is also the best two-year-old, showing a deal of quality, but with straightish shoulders, a light mealy coat, and a curious small pony head. This class was altogether a strong one; and the judges, with but little room to move or compare the entries, were a long time in getting to a decision. The mares and foals were but a middling lot, after taking out the two winners, Mr. Crisp's fine fresh young mare, and Mr. Badham's old Matchett, by this time a winner of nineteen premiums. Mr. Hodson's two are also rather celebrated, Smart having been within an ace of winning the cup as the best of all at Bury last year, while she was backed here with a prize foal by The Pilgrim; and the class further included a very fine mare, now the property of Sir Thomas Beauchamp, but bred by Mr. Gleed, who did better with her than her new owner could at Yarmouth. Sir Thomas had another weighty three-year, also bred by Mr. Gleed, but only second-best to Ruby, a filly from Mr. Ward of East Mersea, that has still improved on her last year's form. The best two-year-old filly was but a leggy, upstanding one, and Mr. Manfred Biddell's more compact in her frame and with better promise of going on. Playford was again second with a smartish foal by The Spaniard; but they don't seem to care about showing The Pilgrim, whose fame will have to rest with his stock. Of course all these cart-horses were Suffolks, the chesnuts gradually driving the old Norfolk bays and browns before them, although Mr. Overman did bring a grand old black as one of his prize pair, but even this was "matched" with a chesnut. Mr. Taylor of Peterborough unfortunately forgot to carry out the threat he made at the dinner last year, of sending a Shire horse or two to shame the Eastern Counties out of their fancy for "soft ones," or the lesson might have been an interesting one, and the more so with a Lincolnshire man again in office. This alone would go to show how ready the society was to accept the challenge.

The dinner at Yarmouth was but thinly attended, though the business of the evening was much to the point, ably conducted as it was by one of the very best chairmen we ever met. With manifestly a taste for his subject, Sir Willoughby Jones never over-ride his hobby, but got through a toast list as long as Leporello's catalogue of conquests, without ever suffering the interest he represented to be shelved, or its due discussion to become in any way wearisome. The general proceedings went indeed very pleasantly, under the direction of an efficient staff of Stewards and a good working Secretary; not, though, that the occasion was altogether without its drawbacks. The barrack yard was terribly cramped, and utterly inadequate to the purposes of a horse show, and the catalogue of the Society is still the most abominable composition of the kind we ever consulted. It contains in reality no information whatever, and its sale at 6d. a copy is simply a swindle. We do hope by another year the committee will borrow "a true and correct card" from either Suffolk or Essex, and frame their own accordingly.

PRIZE LIST.

CATTLE.

JUDGES.—G. D. Badham, Bulmer Tye, Suffolk.

W. Ladds, Ellington, Huntingdon.

Sherborn Bulls.—The Borough Members' Cup and first

prize of £10 to Lord Walsingham (Lord Leve). Second, £8, to T. Crisp (Abbot). Third, £5, to Messrs. Dudding and Sons (Colonel Commis).

Yearling Shorthorn Bulls.—First prize of £5, to W. Harvey (Cockatoo). Second, £3, to Lady Pigot (Pan).

Devon Bulls.—First prize of £10 to J. Blomfield (Warham). Second prize not awarded, there not being the required number of competitors.

Yearling Devon Bulls.—No entry.

Polled Bulls.—First prize of £10 and silver medal to John Hammond. Second, £5, to Sir W. Jones, Bart. The class generally commended.

Yearling Polled Bulls.—Prize of £3 to J. Smith.

Red Polled Bulls.—The President's silver cup to J. Hammond.

Shorthorn Cow, in calf or milk.—First prize of £8 to Lady Pigot (Pride of Southwick). Second, £5, to T. Crisp (Maria). Third, £3, to S. Gooch (Julia).

Devon Cows, in calf or in milk.—First prize of £5 to J. Overman. Second not awarded, there not being the required number of competitors. Commended.—John Blomfield.

Polled Cows, in calf or in milk.—First prize of £8 and silver medal to Lord Sondes. Second, £4, to Lord Sondes.

Cows of any other breed, in calf or in milk.—First prize of £5 and silver medal to H. Overman. Second, £3, to H. Overman.

Shorthorn in-calf Heifers not above three years old.—First prize of £6 and silver medal to Lady Pigot (Princess of Edward). Second not awarded, there not being the required number of competitors.

Yearling Shorthorn Heifers.—First prize of £4 to Lady Pigot. Second, £2, to Lord Walsingham. Commended.—Wyrley Birch, S. Gooch, and Lord Walsingham.

Devon in-calf Heifers, not above three years old.—First prize of £5 and silver medal to J. Blomfield. Second not awarded, there not being the required number of competitors. Highly commended.—J. Blomfield.

Yearling Devon Heifers.—First prize of £3 to J. Blomfield, Warham. Second not awarded, there not being the required number of competitors.

Polled in-calf Heifers not above three years old.—First prize of £5 and silver medal to Lord Sondes. Second, £3, to Lord Sondes. Highly commended.—R. J. Oliver. Commended.—R. J. Oliver.

Yearling polled Heifers.—First prize of £3 to Lord Sondes. Second, £2, to Sir W. Jones, Bart. Commended.—Lord Sondes and Sir Willoughby Jones.

Heifers of any other breed, under three years old.—First prize of £4 and silver medal to H. Overman. Second, £2, to H. Overman.

Fat steers of any other breed, above three years old.—First prize of £6 and silver medal to R. J. Oliver (Polled). Second, £3, not awarded, there not being the required number of competitors.

Fat Steers of any breed, under three years old.—No entry.

Fat Cows or Heifers.—Prize of £4 and silver medal to W. T. Mullen (Polled).

SHEEP.

SOUTHDOWNS.

JUDGES.—H. Fookes, Whitechurch, Dorsetshire.
W. Rigden, Hove, Sussex.

Shearing Southdown Rams.—First prize of £8 and silver medal, to Lord Walsingham. Second, £6, to Lord Walsingham. Third, £3, to Lord Walsingham.

Southdown Rams, of any age.—First prize of £8 and silver medal, to Lord Walsingham. Second, £5, to Lord Walsingham. Third, £3, to Lord Walsingham.

Shearing Southdown Ewes.—First prize, £5 and silver medal to Lord Walsingham. Second, not awarded, there not being the required number of competitors.

Southdown Ewe Lambs.—First prize of £4 and silver medal to Lord Sondes. Second, £3, to G. George. Highly commended, Sir W. Jones, Bart.

Southdown Wether Lambs, bred by the exhibitor, from a flock of not less than five score ewes, size and quality to be taken into consideration.—First prize of £5 and silver medal to Sir W. Jones, Bart. Second, not awarded, there not being the required number of competitors.

Southdown Shearling Ewes, not to be separated from

their flock of Ewe Hoggets earlier than the 1st day of June, nor clipped before that day.—First prize of £7 and silver medal, to Lord Sondes. Second and third, not awarded, there not being the required number of competitors.

Wether Lambs of any breed.—First prize of £5 and silver medal, to J. L. Barrat (cross). Second, £3, J. L. Barrat. Highly commended, J. W. Butler, J. Hammond, and J. Utting. Commended, J. W. Butler.

Shearling Wethers of any breed.—First prize and silver medal, to Sir W. Jones, Bart. Second, £3, to A. J. Overman.

Ewes of any age or breed, from a flock of not less than five score, having brought up a Lamb or Lambs to within three weeks of the day of exhibition.—First prize of £6 and silver medal, to Lord Sondes. Second, not awarded there not being the required number of competitors.

Ewes, of any age or breed, not being Southdown or Leicesters, having brought up a Lamb or Lambs. First prize of £5 and silver medal to H. Overman. Second, £4, to H. Overman.

Shearling Ewes of any breed, not being Southdown Leicesters, or Long-woolled.—First prize of £5 and silver medal, to H. Overman. Second, £3, to H. Overman. Commended, four half-bred Ram Lambs, as extra Stock, J. Hammond.

LONG-WOOLLED.

JUDGES.—S. Field, Farnsfield, Nottinghamshire.

R. G. T. Howard, Temple Bruer, Lincolnshire.

Shearling Leicester or Long-woolled Rams.—First prize of £8 and silver medal, and cup as best long-woolled ram, to T. Brown (Marham). Second, £3, to T. Brown. Third, £3, to T. Brown. Highly commended, T. Brown. The class generally commended.

Leicester or Long-woolled Rams of any age.—First prize of £8 and silver medal, to T. Brown. Second, £5, to T. Brown. Third, £3, to H. Aylmer. Highly commended, Beale Brown. The class generally commended.

Shearling Leicester or Long-woolled Ewes.—First prize of £5 and silver medal, to T. Brown. Second, £3, to T. Brown.

PIGS.

JUDGES.—S. Field.

R. G. T. Howard.

Boars of large breed.—First prize of £4 to W. B. Wainman (white). Second, £2, to T. Crisp (white).

Breeding Sows of large breed.—First prize of £4 to W. B. Wainman (white). Second, £2, to T. Crisp (white).

Boars of small breed.—First prize of £4 and Silver Medal to T. Crisp (black). Second, £2, to T. Crisp (black). Class generally highly commended.

Breeding Sows of small breed.—First prize of £4 and Silver Medal to W. B. Wainman (white). Second, £2, to S. G. Stearn (black). Highly commended: T. Crisp for two sows (black). Class generally commended.

Breeding Sows of small breed, not exceeding nine months old.—First prize of £4 and Silver Medal to G. M. Sexton (black). Second, £2, to the Rev. T. L. Fellowes.

Store Pigs, being of the same litter, and not exceeding four months old.—Prize of £4 and Silver Medal to S. G. Stearn (white).

Pigs on the Sow.—Prize of £3 to S. G. Stearn (white).

CART HORSES.

JUDGES.—C. Blomfield, Hockwold, Brandon.

Marshall Healy, Croft, Lincoln.

Cart Stallion, not under four years old, having covered at least thirty mares during the present season.—The Mayor of Yarmouth's Cup, first prize of £10, and Silver Medal, to G. D. Badham (Emperor). Second, £7, to T. Crisp (Conqueror). Third not awarded, there not being the required number of competitors.

Three years old Cart Stallion, having covered at least fifteen mares during the present season.—First prize of £8 to M. Mumford (Young Emperor). Second, £5, to E. Cottingham (Talbot).

Two years old Cart Stallions.—First prize of £6 to M. Mumford. Second, £4, to J. M. Dawson (Star). Highly commended: T. Crisp.

Cart Mares and Foals.—First prize of £8 and Silver Medal to T. Crisp (Scott). Second, £5, to G. D. Badham (Matchett).
Cart Mares.—First prize of £8 and Silver Medal to E. G. Hodgson (Smart). Second, £5, E. G. Hodgson (Scott). Third, £3, Sir T. P. Beauchamp, Bart.

Three years old Cart Fillies.—First prize of £6 to W. H. Walker (Ruby). Second, £3, to Sir T. P. Beauchamp, Bart.
Two years old Cart Fillies.—First prize of £5 to Jno. Grout. Second, £3, to M. Biddell.

Cart Foals.—First prize of £5 and Silver Medal to E. G. Hodgson. Second, £2, M. Biddell.

Pairs of Cart Horses, whether mares or geldings.—First prize of £5 to H. Overman. Second, £3, to E. G. Hodgson.

RIDING HORSES.

JUDGES.—T. W. Bulling, Toft Hill, Dunchurch.
G. Dobito, Lydgate, Suffolk.

Thorough-bred Stallions, having been used for breeding purposes during the present season.—Prize of £7, to W. Dunham (Young Joe Lovell). Class generally commended.

Stallions for saddle or harness, having covered at least twenty mares during the present season. First prize of £7 and Silver Medal to G. T. Baldwin (Robin Hood). Second, £4, to the executors of the late W. Wright (Shales).

Hackney Mares or Geldings, above 14 hands and not exceeding 15½ hands high, and in the possession of the exhibitor for six months previous to the show.—First prize of £10 to Charles Waters. Second and third not awarded—no sufficient merit.

Mares and Geldings for hunting purposes.—First prize of £5 and Silver Medal to R. J. Kendle. Second, £3, to J. Grout.

Brood Mares, for saddle or harness, to be certified to have produced a living foal within twelve months immediately preceding the day of exhibition. Prize of £8 to T. Crisp (The Yore).

Pony, not under 12 nor above 14 hands high.—First prize of £5 to R. J. Kendle. Second, £2, to E. Larke.

Highly Commended: J. Groit, for brown hackney gelding, 4 years, in extra stock.

IMPLEMENTS.

JUDGES.—H. E. Blythe, Burham, Norfolk.
C. Sewell Read, Plumstead, Norfolk.

Best collection of Implements for the purpose of Agriculture.—First prize of £10 to Holmes and Sons. Second, £3, to Garrett and Son. Third, £3, to the Trustees of W. Crosskill. Fourth, £4, to Woods and Cockedge. Fifth, £2, to Riches and Watts.

Newly-invented or improved implements.—Silver Medals to Merton and Turner, for improved fixing of cups to corn drills; R. Roby, for double-action haymaking machine; John Sainty, for improvement in Gardner's turnip-cutter for cutting last slice; Samuel Warren, for enclosed horse-power gear for working chaff-cutters.

Highly Commended: J. W. Sharman, for boring machine; C. Burrell, for eight-horse power traction engine; A. Dodman, for Clayton and Shuttleworth's combined portable thrashing-machine.

Commended: R. S. Baker, for improvement in sliding brasses of piston rod in steam engine; Richmond and Chandler, for improvement in hand chaff-cutter, and chaff-cutters in general; Coleman and Son, for cultivators; T. C. Darby, for horse hoe; J. Baker, for combined blowing and dressing machines; J. Sainty, for sheep feeding and sheep troughs; E. R. and F. Turner, for steam-engine and machinery in general; Barnard, Bishop, and Barnards, for digging machinery and turnip cutters.

STEWARDS OF THE YARDS.—Mr. Thomas Chambers, Colkirk; Mr. John Fergusson, Wretham; Mr. Samuel K. Gayford, East Wretham; Mr. Henry Overman, Weasenham; Mr. James Reeve, Snetterton; Mr. W. P. Salter, Thetford.

THE DINNER

Took place in the evening at the Town Hall. Sir W. Jones, Bart., as President of the Association for 1863-4, in the chair, supported by the Mayor of Yarmouth, Lord Sondes

(Lord High Steward of the borough) Lord Walsingham, Mr. A. Hamond, Col. the Hon. Wenman Coke, M.P., Sir E. H. R. Lacombe, M.P., Sir T. W. P. Beauchamp, Col. Fitzroy, &c. The general company included the majority of the Judges, and the well-known eastern counties and Norfolk names of Hudson, Aylmer, Brown, Read, Reeve, Overman, England, Salter, Fergusson, Gayford, and others.

The introductory toasts call for no comment at our hands. In giving the health of the Lord Lieutenant of the county, the CHAIRMAN, however, remarked: Lord Leicester in the most spirited manner undertook the greatest and, perhaps, the best experiment in steam cultivation that has ever been carried out—certainly in the county of Norfolk. I am sure it has been a subject of very deep regret (and I say it without the slightest hesitation) to all of us that the wind and tide should have exposed the Holkam Marsh Farm to an inundation such as has taken place this winter. That farm was a most remarkable instance of steam culture. There were 500 square acres worked entirely by steam ploughs, steam cultivators, and other methods of applying steam power. It served as a specimen instance of a steam farm, for which we might seek in vain elsewhere, having been started and got up at very great expense. It is a great loss I may say to an agricultural county that that farm should have been submerged.

The CHAIRMAN in giving the toast of the evening, "Success to the Norfolk Agricultural Society," congratulated the meeting on the excellence of the stock shown during the day, and continued:—"I am speaking in the presence of the great chief of Southdown breeders; but I must remind him that on my left is one who is almost his equal, and who, if not quite his equal, is running a neck-and-neck race with him. It is, therefore, a proud thing that Norfolk, so far from the country whence those sheep were taken, should achieve a pre-eminence so very considerable. But one name occurs to any man's mouth as in any way superior to our Norfolk champion. And, gentlemen, those of you who looked at the Shorthorns, which we were told were not a Norfolk breed of stock, and could not be got to perfection in Norfolk—(I remember hearing that sentiment from the mouth of a judge two years ago at one of the meetings)—I would ask those who have looked at and touched a certain white bull with a square back, a neatly put on head, and a vast number of very good points, to tell me whether a first-rate bull cannot be turned out of Norfolk? It is very true that the bull came from the same homestead whence come our Southdown sheep; all I can say is, that Norfolk is proud of the farm whence they come, and has a right to be proud of things that come from that farm. Gentlemen, it is also satisfactory to me to have noticed a very great improvement in our indigenous stock. It has been rather the habit to look down upon our Norfolk polled beasts, though there were certain men, who, through good report and through evil report, stood by the breed; and we are greatly indebted to the noble lord on my right (Lord Sondes), and I may add Mr. Oliver and some others, for having kept their faith in the stock, which I believe is eminently suited to the county—stock that prosper on very light herbage, and which yield abundance of milk. I have a very high opinion of that stock, and I believe it can be developed to something equal to, if not beyond a Shorthorn, and very nearly equal, if not quite, to a Devon. It will always have one superiority over the Devon in one respect, that the Devon is a helpless being for the pail, while our Norfolk polls will give a good pailful of milk. There are also other advantages connected with those animals; their perfect tractability and quietness, their freedom from horns, and the manner in which they leave your trees and fences uninjured, are, I think, very good points in their favour. I

therefore took what I thought was a desirable step to encourage this breed of stock by offering a cup for the best bull. In offering that cup I limited the animals to be animals without either slugs or horns, my object being to prevent our milk from being bred away by crossing with a Devon, or endeavouring to get a Devon back. My belief is that we may get a Devon back without impairing the purity of our breed; therefore I set myself against anything which shows cross breeding in the stock. I shall be very glad another year—for I mean to continue the cup—to put a further limitation as to any spots of white upon the animals; therefore, though the prize was given to a spot of white this year, I cannot say what may happen another year. I am firmly persuaded that where you see a spot of white in our red Norfolk polled beasts there is bad breeding somewhere, and a spot of white tells of stray shorthorn blood put in many years ago, either to square the back, or for something else. I do not wish to see the breed impaired; I wish to see kept up the very great qualifications which our breed possesses as dairy stock, and I set myself against anything which showed the smallest impurity in the pedigree of the animal that wins the cup. With respect to other matters, I feel I ought to detain you no longer, but I cannot help noticing one or two small points, trifling points, perhaps, in which I think the county of Norfolk may improve, if possible, their agriculture. It seems to me that one very remarkable point which is neglected in Norfolk is our arterial drainage. The old-fashioned idea was that the land was to grow corn, and the water and the wind were to grind it. We have found out since a power of steam that will grind all the corn that we can grow; therefore, I think we ought not to dam up our sluggish streams to have scarcely a ripple on them until they are really like a flight of steps (Cheers.) I may say that thousands of acres of this county lie at the bottom of our Wensum valley, our Nar valley, and other valleys. And let me point out this to you, that where nature has given water a flow, that flow is the cause of the bottom or bed of the river in which it takes place, being kept pretty nearly at a constant level. The impurities which come in our drains every year and decaying vegetation, are carried down by the stream. But when the stream is dammed up that is not the case. The result of centuries of damming up in many reaches of our Wensum river is, that the bed of the river is above the land on either side; the river runs on a raised course. But this question may seem out of place here now (No, no), but I am sure you will find it out somehow or other, for when our increased consumption of animal food has sent it up to prices a little higher than they are now, you will find it will never be tolerated, that the water which ought to drain the river beds, which ought to drain the land, should be made the means of grinding corn. In these days of steam power the thing is an absurdity, and must be remedied. It is as absurd as to compel a man who buys 50 acres of land to buy with it a chest full of title deeds, and to compel him to spend £300 or £400 to have them examined, to see whether the land is the property of the man who sold it to him. Both these questions—the flooded valleys, and the choked-up drains in the slightly undulating ground which goes down into the valleys, and the difficulty there is of disposing or buying a small parcel of land—will have to be remedied sooner or later, and I am certain that the best cure for them is the high price of mutton. There is only one other

point for me to allude to, in which I think the Norfolk agriculture might improve itself, that is, in the management of our fences. Gentlemen, our fields are beautifully tilled; and it is impossible for any one to turn from touring in a distant part of England not to be struck with the cultivation of this county. I believe it is not altogether owing to any remarkable aptitude in ourselves. I believe we are blessed with a remarkably handy, useful, active set of labourers. I believe, besides, that our friable soil allows the implements to work much better than in a soil which is at one time mortar and at another bricks. I believe the implement has a fair chance in Norfolk, when it has not elsewhere. To these two things put together, and to the fact that our horses can get upon the land at all times, I believe the admirable cultivation of our fields is due. But it is impossible not to travel about England and not be struck, on coming back to Norfolk, with the superior cultivation of Norfolk fields. These fields are beautiful pictures, and I should like to see them encased in a frame worthy of them, instead of a frame composed of a mixture of a bit of live fence and a bit of dead stuff, about four feet high, not quite perpendicular, and with a bottom taken out of a muck-heap, and overshadowed by some ash trees worth five shillings each. (Laughter and cheers.) I confess, that to my mind, the Norfolk fences are not worthy to surround the Norfolk fields. I leave it to you, who understand these things far better than I do, to say how a better hedge is to be put round the fields. I think it a consummation greatly to be desired, if that can be applied, and if our fields can be enclosed in a frame that is worthy of them. Gentlemen, I must add the one word which I always do—"Build more labourers' cottages." That is the last word I always utter. I believe that one half of the crime and misery in the county arises from the overcrowding of what is called the home parish—('Hear, hear,' and cheers)—that is, the parish which contains the labour of a number of fields and a number of farms, most fertile and most admirably cultivated. It is that parish which contains the labour which supplies our sessions and assizes. Gentlemen, build cottages near your farm houses; or, I would say, let cottages spring up near your farm houses, and I believe we shall see a very great improvement in all these things.

Mr. BIGNON, in returning thanks for the judges, said: "I think Lord Walsingham's shearling was nearly the best sheep I ever saw him show. He will, however, excuse me if I say it has a fault which will stand very much in his way if it goes into company; but taking it altogether, that sheep has some extraordinary points. I fully admit, with reference to the cross-bred sheep, that some of the lambs were the best I have ever seen in Norfolk. But when gentlemen talk about getting these long-woolled sheep, they seem to me to forget how much they eat. I happened to hear a shepherd to-day say that twenty-six lambs had one cwt. of oilcake per day. I should like to ask a gentleman how much they cost. My sheep never see a bit of cake from one year's end to another. They live upon the South Downs, have the south-west winds, and have no shelter whatever. I am not going to say they are the best for Norfolk, but I can get more money for nine stone of Southdown mutton than you can get for ten stone of any other sort. I have no wish to praise my own breed, but I am quite sure that in the county of Sussex the Southdowns will maintain their reputation."

AGRICULTURE AND MANUFACTURES:

In our former article on this subject we stated that, in the progress of British industry, the trading and manufacturing population had largely increased their numbers in proportion to the agricultural, and endeavoured to explain the cause of the disparity. We also pointed out that, while manufactures may be regarded as the superstructure of the social edifice, agriculture must ever remain its foundation. In pursuing and illustrating the general argument, we directed attention to that law of equipoise which establishes proportionate relations between raw materials and the various fabrics into which it can be converted, showing that the former proceeded from the plough, while the latter was the creation of the loom or of the steam-engine. Now it is in this priority of production that the superior claims of agriculture become conspicuously manifest to our reflective faculties, for the farmer must take the initiative in all industrial combinations; to this law there is not a single exception. Of all commodities earth is the prolific mother, either on its surface or in its interior. We may admire the marvels of manufactures—their utility, their beauty, their abundance, their diversity; but however cunning the hand of the artificer, however curious his workmanship, however commendable his ingenuity, let us not forget that the ultimate *capital* on which he labours is the generous, the opulent, the indestructible earth. That is, in the last analysis, the only true measure of commerce, of exports, of mercantile navies, of the forge and the factory, of the bank and the railway. Let the earth refuse her raw material, the doom of trade and manufactures is sealed. This, however, is little thought of by the world at large, and engages too little of the solicitude of statesmanship. We appreciate at their proper value all the advantages of external commerce, but we are not insensible to its precarious character. The teachings of history are too strongly present to our memory to be slighted. We know what Venice was, and knew what Venice is. The great republics of Italy, Genoa and Pisa, have sunk into comparative insignificance. The Hanseatic cities are but the shadows of former greatness, and the once flourishing marts of Flanders have dwindled into relative nothingness. Into the causes of these mutations we are not at present called to inquire; it is sufficient to refer to the fact, in an argument which turns on the contrast between the stability of agriculture and the precariousness of manufactures. Land, it is true, may decline in money value, measured in pounds, shillings, and pence. It will rise when populous towns of industry in its immediate neighbourhood furnish a market for its produce, and it will retrograde as those towns become thinly inhabited; but it will never be deserted so long as it retains enough fertility to grow food, unless taxation renders the plough unproductive to the cultivator.

The only sure sign of a healthy state of society is where the various forms of industry are so nicely balanced in relation to each other, that each can dispose of its products by a common standard measure of remunerative price. If either fails to receive this equitable reward, symptoms of decay are manifest to a discerning eye. What remunerative price may be, in a money denomination, depends on various circumstances; but it is equally due to all producers. To talk of buying cheap and selling dear, except in rare exceptional cases, is sheer folly, for it could never be sustained as a general rule of trade. If food is cheap or dear, goods must be cheap or dear, in

every estimate of the *home trade*, where one portion of a community exchange the results of their labour against the results of the labour of another portion of the same community. But this mode of exchange of course ceases when one portion of the community seeks its wealth from foreign trade. It is in this manner that conflicting interests, either real or apparent, may arise—not, indeed, necessarily or absolutely; but such may be the intrusion of modifying circumstances, that the contingency is possible.

Let us, then, take the case of various sections of a community living under the same government, and of course obedient to one uniform legislation, but prominently divided, in an industrial sense, into agriculturists and manufacturers. Let us further suppose that the former are not exporters of corn, while the latter are exporters of goods. Now the proper market for the exporters of goods is a purely agricultural community, not yet advanced to a manufacturing condition. Here, then, indeed, the exporters of goods may sell them dear, and buy agricultural produce cheap; but as the exporters of the goods could not themselves consume the agricultural produce which they had received in exchange, they must find a market for it in some other community than that in which they sold their goods, for there, by the hypothesis, it is not wanted. They seek that market in their own country, and the produce thus imported is equivalent to an addition to the cultivated area of their own country. By adding what is grown abroad to what is grown at home, the cardinal rule of commerce, that quantity governs price, comes into play, and less money is given for produce than before the importation of the foreign article, and this is money cheapness.

If we subject this operation to a searching analysis, this lower cost of production may be traced to two elements—first, an inferior standard of living or dietary; and, secondly, a more moderate scale of taxation. The lower dietary is accompanied by a lower rate of wages, while the lower taxation allows the grower in the foreign country to be satisfied with a lower rate of profit. That cardinal rule of commerce, which teaches that quantity governs price, will always lower the tariff of a market, whatever the cost of production may be, for the law of supply and demand acts imperiously; but in the case now immediately before us, it is to be observed that the foreign portion of the supply is sold for remunerative price, while the native portion of the supply may not realise that advantage: this must depend on the extent of the fall measured in the cost of production. If the price still obtained covers the tax, and upholds the former rate of wages and profits, the native producer is not injured, although the foreign producer is highly benefited, and the great body of consumers have bread more cheaply than they would have had without the foreign competition. On such an hypothesis prosperity is diffused equally among all classes, because in all directions the principle of remunerative price becomes a reality; the manufacturer secures a good foreign market for his exports, while his customers obtain a good market for their agricultural produce; at the same time, the home grower is enabled to pay his tax with ease, and the dietary or general standard of living is not reduced to the labourer. All the various groups of industry enjoy remunerative price, and thus would be established that law of definite proportion by which equal values are

exchanged for equal values. In such a state of things, agriculture and manufactures are in harmony.

But is this balance, which theory admires and aims at, reduced into practice? Quite the contrary. So far from any such steadiness of relation existing between the different groups of industry, we are constantly witnessing the most violent oscillations, and not unfrequently the most deadly antagonisms. Among the trading classes it is quite common to hear such language as the following: "Did you ever know a satisfied farmer? Is he not proverbially a constant grumbler? Does he not always complain of low prices?" It would be easy to retort the spirit of these vulgarisms, for similar murmurs may be heard in the factory, the warehouse, and the shop; and all arise from one common cause—the violation of the law of definite proportion, the true polar star of all honest trade; for that law is the expression of remunerative price—the sole incentive to labour.

Let us state the argument in another form. This country, it is assumed—whether rightly or wrongly we are not now called upon to inquire—has arrived at the maximum of bread-corn cultivation, while that maximum is inadequate to supply the demand of the population. Without foreign importation, the people could not be fed, for prices would rise to a famine rate; then, of course, manufactures would be enormously contracted, if, indeed, they did not wholly cease. Such a loss the nation could not sustain, without the most fearful impoverishment; hence it becomes both politic and humane to receive and even to encourage foreign corn, and if this can be done, without depriving the home grower of that scale of remunerative price to which he is entitled, the problem would be solved. But let us be definite and precise. What constitutes or measures that scale? Clearly the cost of production. Does that cost differ in any sense or degree from that incurred by the foreign competitor? Clearly it does, or at least it may, for the home grower may have to sustain a heavier taxation, and may have been habituated to a superior dietary; if that be his position, surely he does not compete on equal terms, and here then arises between the agriculturist and the manufacturer that deviation from the centre to which we have referred. A divergence from the common central point of the

two interests spring up, and what favours the loom damns the plough: the introduction of foreign corn diminishes the cost of production to the manufacturer, while it deprives the home agriculturist of remunerative price. In this manner these two groups of industry come into conflict, and the fact thus stated is not to be denied by any one who respects truth, however it may wound his prejudices.

Let none suppose for a moment that, under this mode of presenting or treating the argument, there lurks any covert leaning to a prohibitory system. We have no desire for a return of those unhappy days, when the prosperity of the plough was measured by the adversity of the loom, or reversely when the impoverishment of the farmer stimulated the exports of the manufacturer. No doubt the manufacturers have benefited in recent years, for the proof is in the largely increased exports, though these have been influenced to a much larger extent than is acknowledged by the discovery of the gold mines of California and Australia; but agriculture displays no such proportionate augmentation in produce, while prices have declined. Thus, in the last published returns of imperial averages of corn, where the price was 59s. 7d. in March, 1862, they are in 1868 as low as 46s. 6d. If we look to the Blue Book Reports of the British Consuls in foreign countries, we have conclusive evidence of the intense desire felt by all agricultural nations to enter our grain markets, for a low price to our own farmers is a remunerative price to foreign growers. Hence we read in the Consular Reports of the energy displayed, especially in the neighbourhood of the northern ports of Europe, to connect the fields with the harbours by railways, and deepen the channels of rivers and canals conducting to the sea. From such efforts it is plain that the cardinal rule of commerce—quantity governs price—will from year to year receive a more vigorous demonstration, and therefore that the imperial averages will rather decline than increase.

We have endeavoured to argue this question impartially and without bias. In the wise dispensations of Providence, it is equitably ordained that no industrial interest shall permanently flourish at the expense of its neighbour, and the cries of poverty will alarm the feasts of opulence. The law of definite proportion is a perpetual warning to selfishness, and exhorts us to rectify the balance wherever it is disturbed. No doubt all irregularities are susceptible of adjustment, for to maintain the contrary would be to deny the possibility of justice enforcing its purpose; but how the harmony between agriculture and manufactures may be maintained is a very different problem from that which traces their discord to its source.

THE AGRICULTURAL MEETING AT LILLE, DEPARTMENT DU NORD.

The meeting of the Agricultural Society of the north of France was held this year at Lille, with some success. The machines and implements began to come in on Saturday the 6th, and on Thursday morning the 11th of June the esplanade was opened to the public. The animals were not admitted until the latter day, and the jury at once commenced their inspection for the purpose of awarding the prizes. The number of stocks of all kinds entered amounted to 752, that of agricultural machines and implements to 805, and the catalogues of agricultural products contained 291 specimens. An international agricultural exhibition was annexed by the authorities to the Regional, comprising 171 lots of animals of all kinds, 298 machines and implements, and 98 specimens of agricultural products. To these must further be added the separate exhibition of horses, amounting to 276. There were, therefore, collected upon the esplanade 1,119 lots of animals, 1,103 machines and implements, and 398 specimens of agricultural products.

The trial of the steam ploughs commenced on the Thursday morning, and was continued in the afternoon, when the public were admitted to the ground.

All the machines and implements worked by steam were

placed in the galleries, in front of which were those of tillage, such as ploughs and harrows. A great improvement was observable in the construction of these, as well as of other implements; and advances have been made to do away with, or to lessen the amount of, hand labour, either by new implements or the improvement of those in use. By the side of the "elegant English locomotive engines" were placed those of the firm of Devoir, now Albaret and Co.; those of M. Debière, of Lille; and, specially, the beet-root rasp of M. Farinaux, of Maromme.

Saturday was the grand day, on which a splendid company attended; but whilst many of the machines—the steam engine of M. Boyer for instance—and the animals generally excited their admiration, the show of horses was indisputably that which attracted the most profound attention as the most remarkable feature of the exhibition. The meeting was only open to the English so far as implements were concerned; our manufacturers, however, not speaking very highly as to the conduct of the proceedings. Premiums were, in fact, awarded on the shortest and most unsatisfactory of trials, and hence a publication of the prize list would serve no useful purpose.

LONDON WOOL SALES.

An attempt is being made to induce the British farmers and wool-growers to submit their wool to public competition at periodical sales in London; and although commenced under good auspices, it remains to be seen whether old customs and local connexions can so far be broken through as to bring the practice into general adoption. That the plan would be attended with many advantages, there can be no question, looking at the large attendance of home and foreign buyers at the existing metropolitan and Liverpool colonial wool sales. But probably it will be opposed by the provincial agents and collectors, who buy for the factories.

There are now about 1,700 woollen factories in the kingdom, of which 1,460 are in England and Wales, 190 in Scotland, and 40 in Ireland. To these must be added 532 worsted factories; and these figures show an increase of nearly 220 in the number of factories in the last ten years, and of 20,000 in the number of persons employed. The consumption of wool in these factories has enormously increased. Whether the local wool fairs answer all the purposes required, we cannot say; but there can be no doubt that many farmers lose much by the want of proper competition at a public sale, where there is a large attendance of *bona fide* purchasers, and the manufacturers of Bradford, Leeds, and Lancashire get the benefit of those wools cheaper.

The periodical public sales of colonial wool, which now occupy so important a position among the commercial occurrences of the British capital, date their origin only so lately as the year 1817. The prices at that time and for some subsequent period were only from 2d. to 3d. per pound; and it was not until twelve or fourteen years afterwards that any important advance took place in the value of this commodity. The fine quality of the Australian wool soon after began to attract notice, and in 1835 and 1836 to draw the attention even of foreign manufacturers. From very small beginnings the extent of the periodical auction sales gradually increased. An unprecedented number of 750 bales was announced for one series of sales in 1825, and for some years afterwards 400 bales was considered to form a very extensive sale. But in July, 1835, 874 bales were brought forward, realizing for the better qualities the considerable rates of 2s. 6d. to 3s. 6d. per lb.; and at the sales of the same month in 1844, there were exposed no less than 81,358 bales. Large as these quantities were then thought, they are quite thrown in the shade by the public auction sales in London of the present day, when from 60,000 to 100,000 bales are sold in one series extending over a month. The early London wool sales were held at Garraway's until 1843, when they were transferred to the Hall of Commerce, Thread-needle-street (now the offices of the Bank of London).

In the last ten years the increase in the supply of home-grown and colonial wools at the command of the English manufacturers has amounted to fully seventy-five per cent. This greater abundance of the raw material has not reduced its value, but, on the contrary, the price of those sorts required for the fabrics suitable to the present habits of the people of the mother-country and for foreign markets has advanced materially; the general consumption of woollen goods increasing still more rapidly than the sheep to supply the additional fleeces. While in 1852 the total import of foreign wool was but 93½ million pounds, in 1862 it had risen to 170 million pounds, besides 20 million pounds of woollen rags torn up to be used again. About 48 million pounds of this foreign wool was re-exported last year.

The value of the British-grown wool and the woollen manufactures, of all kinds exported last year, exceeded 23½ millions sterling or more than double the exports of four or five years ago; and the home-consumption of woollen goods has also proportionately advanced in consequence of the deficiency of cotton. The nature of the fabrics, it is true, have somewhat varied. Thus, broad-cloth has given way to tweed and other cheaper cloths not felted; while the lighter stuffs for women's use are made from the finest Australian combing wools, the long lustre wools of England, and the wool of the alpaca. We may fairly reckon the home clip of wool at 200 million pounds, and probably a large portion of this within reasonable carriage distance might be brought to London for sale, seeing that it is stated that the extra charges on sale and transport within 100 miles of London will not exceed a half-penny per pound. The London wool-brokers have already done much to promote the business character and extent of the colonial and foreign wool sales, which have now a high continental reputation, and there is no reason why their exertions and their business connections should not be extended to the English counties.

It is urged that the plan of public sale is found highly beneficial in the Colonial ports, as well as at Glasgow, Leith, Harwich, &c.; and therefore it would be attended with equally good results, as far as regards English wool brought to London. If foreign wool, to the value of two millions sterling a year, draws a large amount of purchasers—averaging three to four hundred buyers—not only from our manufacturing districts in Yorkshire, Scotland, and the West of England, but also from France, Germany, Belgium, and other parts of the Continent, a great central market in London for British wool would prove equally attractive, and draw customers from abroad as well as at home. A better opportunity would certainly be afforded to all for selection to suit their special requirements, and the full market value would certainly be obtained. Some of the objectionable practices which it is intended to supersede have been thus set forth in our columns:—

"Under the present system a market price for the wool of various counties, and different breeds, is generally arrived at through the medium of fairs held in different parts of the country, and the opening prices of the clip at these fairs are the basis upon which agents or collectors subsequently work. In order to prevent that full and fair competition which every other produce of such universal consumption should, and does command, many of the agents or collectors agree amongst themselves not to compete or interfere with each other in certain districts. The result is obvious:—the prices for certain breeds or flocks being established, the collector or agent offers to take the farmer's clips at these prices. Any farmer in his district who may have taken special care to improve his breed, or get up the wool better than his neighbours, should expect to reap an adequate advantage; but it is not often so. The agents or collectors gain the benefit which should reward and encourage the more enterprising and intelligent farmer who has given special attention to the improvement of his flock."

Although the public sales of British wool in London may not attain to the magnitude of those of foreign and colonial wool; yet, within a certain radius, it may answer the purpose of the farmer to transmit his wool to the metropolis for competition among the consumers and dealers, who are fully able to appreciate the intrinsic value of the several lots.

STEAM CULTURE MECHANICS.

We have now to examine the rope from the grooved drum and winding drum to the implement, in order to ascertain how force is applied to overcome the resistance of the latter in loosening and turning up the soil. In the case of the grooved-drum and clip-drum system there is only one rope, one end of which is yoked to one end of the implement, and after passing round the clip drum or series of grooved drums, and round the anchor pulley at the opposite headland, the other end of the rope is yoked to the other end of the implement, one or two small drums being used for taking up the slack, so as to make it sufficiently tight, and also to shorten or lengthen it when the headlands are not parallel to each other. In the case of the winding drums, there are two, three, or four ropes, according to the number of drums and implements in the system and mode of laying down the tackle. Thus Heathcoat, with his engine halfway between the two headlands, used three ropes, when his principal carriage was only furnished with two drums—one on each side; one end of the first rope being fixed to the barrel of its drum, and the other to the front of the implement on that side. The second rope in the same manner would have one end fixed to the barrel of the opposite drum, and the other end to the front of its implement. These two ropes are hauling ropes for working the implements in action, and only extend from the engine to the auxiliary carriages—one on each side. The one end of the third rope is yoked to the opposite end of the first implement; then the other end is passed round the pulley of the anchor on that side, and taken either round the field or across it below the engine, and after being passed round the pulley of the anchor on the opposite headland, is yoked to the other end of the second implement to that to which the second rope is yoked. This rope (the third) is either for hauling the implement when in action, or only when elevated above ground. In the former case it requires to be a stronger rope than either of the first two; but in the latter case an old rope or a much lighter one may be used. When four drums are used, two on each side of the engine, then four ropes are required to work the two implements, two on each side. The first two ropes are yoked as above, one on each side, to the two implements; but the third rope being now divided into two, thus makes four; the one end of the third rope being yoked to the opposite end of the first implement to that to which the first rope is yoked, and its other end, after passing round the anchor pulley, being brought up to the engine, and fixed to the barrel of the second drum on that side. The fourth rope is yoked to the second implement and fourth drum in a similar manner to what the third rope is yoked to the first implement and second drum, one end being yoked to the implement, and the other, after passing round the second anchor pulley, being brought up to the engine as above, and fixed to the barrel of its drum. The third and fourth ropes are used either for hauling the implements when ploughing or not ploughing, and require to be heavier or lighter than the first and second, accordingly as the case may be. But when the engine is placed upon the headland, and uses two drums in actuating one implement on the indirect system of haulage, then there will be but two ropes, one to each drum; the one end of the first being fixed to the barrel of the first drum, and the other yoked to the implement; the one end of the second rope being next yoked to the opposite end of the implement; the other end, after passing round the anchor

pulley, is brought up to the engine, and fixed to the barrel of the second drum. Under Osborn's system, of two engines placed on opposite headlands, each having two drums, and the four drums hauling two implements between them, four ropes were used. In this case the ropes pass directly from the drums to the ends of the implements next them; so that their position and mode of yoking require no description.

The length of rope used under the different systems is as various as its position. When working two one-way ploughs, as M'Rae's implement, the length of rope under the direct-traction system of Osborn is with one-way ploughs just three times the length of the land, two of the four ropes being only half the length. Under M'Rae's system and also that of the clip-drum, about one-third less rope is required, but only half the quantity of work is done; so that under the question of comparative merit Osborn requires a much less quantity of rope, and when we take into consideration the conclusion formerly arrived at, that with proper reeling apparatus and large drums the tear and wear upon the rope and expenditure of power under this system are less than under any of the others, we have said enough to turn attention to the peculiar merits of Osborn's system. With two drums when it does not pass round the field, the length of rope required under Heathcoat's system is twice and a-half the length of the land, there being always a half-length of coiled rope. But with four drums the length of rope is three times that of the field, two half-lengths being coiled.

The rectilinear position of the rope under Osborn's system, it will thus be seen, is the most favourable for communicating and applying power to actuate the implement. In other words, in hauling the implement the rope acts with greater advantage both as to the economy of power and tear and wear than it does under any of the other systems. This arises (1), from the shortness both of the hauling and slack rope; (2), from neither having to pass round an anchor-pulley; and (3), from the fewer rope-porters required, including under each of these three heads the practical consequences that belong to it.

1. With the length of the rope its weight increases, so that the shortness under this or any other system, whatever the advocates of the round-about plan may say to the contrary, is of the highest practical importance to permanent success. It was the weight and friction of the chains used by M'Rae and the other early pioneers that was experienced the great drawback, and not anything mechanically defective in the implement. Had our West India colonists of Demerara been in possession of steel-wire ropes, steam-culture would have been one of the great realities of Guiana up to the present time; for the intelligent planters of that colony would have been going a-head, improving their implements and tackle as experience unveiled new appliances in advance, but the heavy chain so barred the door of progress as to prevent discovery; and if we at the present time had only been in possession of the chain, the most successful implement now in the field would have been a complete failure. Now, as every link added to the length of the chain was found by experience to exhaust motive-power, leaving less and less to haul the implement, just so is it with the wire-rope; for every inch added to its length exhausts force, thus leaving less to actuate the steam-plough or other cultivator. There is a limit to the distance over which a wire-rope can carry a given force so as to haul the steam-plough, and the length

is much less than is generally credited. Those who tell us the contrary, may with as much truth tell us also that a big winding-drum may be started at Birmingham to actuate all the steam-ploughs in the united kingdoms; which is doubtless a very nice theory, but about as ridiculous a practice as can well be imagined.

2. Again, the weight of the rope is not the only thing that diminishes motive-power: its rigidity and elasticity that have to be overcome in passing over anchor-pulleys, and the changing of the force from one line of direction to another, which always take place when it has thus to pass round anchor-pulleys, still further decrease it, thereby leaving less power available to haul the implement. It is common in scientific works to suppose bands and ropes perfectly flexible, and a very general notion also prevails that the whole of a force can be passed round a pulley; but the first is only an hypothesis purposely advanced for the sake of argument, while the second is a popular error. The facts of the case, as illustrated by experiment, are simply these: The less the diameter of the pulley the greater amount of force consumed in overcoming the rigidity, &c., of the rope; and the further the rope is turned from the first line of direction to a second or third, the greater the loss of power, and the less the amount that is left available for overcoming the resistance of the implement in ploughing land,

8. Power is also lost in passing the rope over a rope-porter. The loss in this respect may be less than it otherwise would be were the rope hauled over the ground without porters. But the truth of this does not in the slightest degree militate against the soundness of the previous conclusion as to the loss of force; and on level land more force may be spent in the hauling of the slack rope behind the implement than in hauling the tight one in front. This arises from the slack rope being the longest, and consequently the heaviest, from its bending more between the rope-porters, and from the force passing over them at a more acute angle; hence the greater waste of power, as already shown. Again, when lands are divided in the middle, or on Osborn's one-way plough system, or when working scarifiers, or on Heathcote's plan, the surface traversed by each implement will, for the most part, be more in a plane than the whole length of the field, so that there will be less loss of power in passing over convex surfaces, when the land is thus divided into two lengths, than when the implement traverses the whole length of the field from headland to headland.

The position of the rope is thus very different from that of the traces of teams under horse-culture, and, consequently, the "line of draught," as it is popularly but erroneously called, when the team is hauling the traces, as seen on one side, may indicate a line or plane from the shoulder to the cope of the plough; but in hauling round an anchor-pulley, under steam, the traces are moving one way, and the implement directly the opposite. No doubt, according to physical laws, when motion is given to a rope every inch of it has a tendency to move in a line; but in the case before us, and indeed in all cases, adverse forces interpose, such as gravitation, the resistance of the atmosphere, and other opposing bodies. Under horse-culture, it was shown that the ground under the feet of the horses, under the heel and wheels of the plough, and before the point of the share, and also the shoulders of the teams, the draught-pins of the cope and whippetrees, were so many fulcra, each fulcrum being subject to adverse forces acting antagonistically through the instrumentality of the numerous levers comprised in the system. And just so is it in the case of steam; for the ground under the engine and winding-drums, under the rope-porters and anchors, is, in every example, a fulcrum to the several members of the motive power (the feet of the steam-horse, if we may

so speak), as is the ground under the feet of the team. Again, the ground under the heels of the ploughs, before the shares, and under the carriage-wheels, form together another system of leverage and fulcrage; but to this we shall return more fully under "implements."

It was also shown, under horse culture, that the lines of draught formed vertical and horizontal angles with the lines of resistance, or, practically speaking, the bottom of the plough furrow, the whole forming a *system of angular forces*, as it may not inaptly be termed. Under steam we have a similar system of angular forces exemplified; but the shoulder of the steam-horse does not preserve the same degree of parallelism to the line of resistance as the shoulders of the team, nor the same uniform distance from the share or length of traces, while, generally speaking, the steam-horse pulls at a lower or less vertical angle than does his rival.

It was further shown that the four lines of draught proceeding downwards from the four shoulders of a pair of horses yoked abreast, and four forces thereby transmitted, were balanced on a common fulcrum, viz., the draught-pin of the yoke or large whippetree, by means of the whippetrees, before it was applied to the implement. But the steam-horse has but one shoulder, with which he hauls by means of a single rope three or four ploughs; so that we have a different theory, and as different a practice to investigate: for there are now four lines of resistances, and but only one line of traction, whereas in the other we had four lines of traction and only one line of resistance, the latter not being in a line with any of the four former, but having two on each side. With the horses all in the furrow, or on the unploughed land, the line of resistance was on the left hand or right hand, or "near side" or "off side," of the horses, as the case may be. With a steam plough having two sets of four furrows each, there will be two lines of resistance on the furrow side of the line of traction, and two lines of resistance on its land side; so that the point to which the rope is yoked forms a fulcrum over which the four resisting forces are balanced, being just the reverse of the former—the horse case. In practice, however, the rope does not thus move or haul always with the two lines of resistance on each side, for it may occasionally be seen wholly on one side of the implement, and sometimes as far on the other; hence the resultant forces arising from steering. Hence also the application of the old maxim, "a good-going steam-horse makes an easy-held steam-plough"; for upon the proper steering or driving of the rope, so as to make it haul evenly and uniformly in a vertical plane, thereby preserving the points of resistance in equilibrium, will depend the action of the steam-plough and quality of work done. As it is with the horizontal angles of draught that affect the breadth of the furrow, so is it with the vertical angles that less or more interfere with their depth; but in the case of steam, the latter is more difficult to control, owing to the length of the traces (the rope), the undulating surface of the ground, and the rope porters that raise the rope, each rope-porter pulley forming, as it were for the time being, the shoulder of the steam horse. Thus, in passing over a convex surface, the rope frequently touches the ground; whereas, in crossing a valley or passing over a concave surface, it rises often higher than the head. Even on level ground, or a plane sloping surface, the rope, when a rope porter, is taken out of the way of the implement, falls lower, pulling at a less angle, and as the implement nears the next rope-porter the angle increases. This decrease and increase of the vertical angle of draught, under steam culture, is thus very different from what it is under horse culture, and, therefore, suitable provision requires to be made for it in the construction of the steam plough, as will be shown in our examination of its details of mechanism.

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Such is a brief outline of the manner in which a wire rope is communicated by a wire rope in hauling a steam plough. Compared with the chains used in the early period of steam culture, its mechanical advantages are many. It is no exaggeration to say that the success of steam in the field at the present day is entirely owing to the merits of the steel wire rope. Those who are making and using steam ploughs are constrained to acknowledge the truth of this; but while they tacitly do so, they are at the same time not giving the wire rope credit for that peculiar merit due to it in the progress of steam culture, as has already been stated. On the contrary, they are placing under a bushel mechanical claims, apparently for the purpose of concealing the merits of some of the first steam ploughs reduced to practice, as, for example, McRae's, in order to make people believe that their own steam ploughs now in operation possess a higher degree of merit in the march of progress than they do in point of reality. As a matter of manufacturing and commercial policy on the part of monopolists, inventors, and proprietors of patents, this may be ingenious; but in mechanical science it is highly reprehensible, and never fails of ultimately being overtaken and publicly punished by the retributive hand of Justice, thus proving the soundness of the old precept—*"Honesty is the best policy."*

We have now arrived at not the least interesting division of our subject, viz., the STEAM PLOUGH. Opinion has long been divided as to the principle of mechanism best adapted for the steam horse, some advocating rotary action, under the conviction that a greater subdivision of the soil ought immediately to be effected than upon the old plan of the plough; others, that the reciprocating action of the spade is that which promises the most successful mode of cultivation; while a third have maintained that the old plan of the plough, with all its shortcomings, is preferable to either. Into the comparative merits of the three systems our present limits will not allow us to enter: suffice it to say, that up to this date experience has pronounced her award in favour of the plough; and, therefore, we propose confining our observations almost exclusively to this implement in this series.

Steam ploughs may be divided into two classes—(1), those only adapted for ridge ploughing; and (2), those constructed for one-way ploughing, i. e., for laying the furrow slices all in one direction, thus leaving the ploughed land without open furrows or ridges.

Of the former of these two classes little now requires to be said, as the thorough drainage of land has rendered the latter preferable. But when steam ploughing was first proposed, and indeed up to a very recent period, ridge ploughing was essentially necessary to effect the surface drainage of a large area of land; so that steam ploughs had to be constructed for this kind of work. To overlook this fact in our notice would be doing an act of injustice to several of our most talented pioneers who merit the contrary at our hands.

Of ridge steam ploughs, for ploughing land lying in ridges, and for drilling for turnips, we may mention those of Major Pratt, patented in 1810 (No. 8,309); Campbell and White, patented in 1839 and 1840 (the former No. 8,108 and the latter No. 8,517); Clarke, Freeman, and Varley, 1846 (No. 11,077); and Osborn, 1846 (No. 11,304). Into their mechanical details it would be a waste of time and space to go. As old patents, those of Campbell and White possess the most merit and attention of inventors.

One-way steam ploughs have been constructed on two plans—(1), the two sets of ploughs being placed heel to heel; and (2), the two sets placed share to share. The latter only merit a detailed notice. To the former we shall merely refer, as in the case of ridge ploughs.

Of patented steam ploughs, the two sets placed heel to heel, those of Major Pratt and Osborn above, may be mentioned, and more recently Lacy in 1855. Of the reduced to practice not under patent, the example of J. Willoughby de Eresby merits the most favourable notice. The chief difficulty experienced is the position of the furrow-wheel of the carriage; but into details of this kind we shall not enter, as the system has been superseded, at least for the present.

One-way steam ploughing, as now practised by J. using Fowler's steam plough, has many things to recommend it; and the first implement of this kind on our list of patents is McRae's, mentioned in previous articles. It was successfully reduced to practice in Scotland, but constructed on a plan differing in several parts from the one represented in the drawing accompanying his specification (No. 8,329, A.D. 1839), and was shipped to Demerara. But previous to this, various propositions were enunciated for ploughing land on this plan by agriculturists, engineers, and others; and of these one was patented by A. Pinkus (A.D. 1839, No. 8,207), resembling in some particulars that of McRae's. The latter, consequently, in the reduction of his proposition to practice, had to avoid infringement of the former's patent, and it will therefore be necessary to notice the peculiar claims of Pinkus's implement, so as to be able to solve the interesting question as to who is really "the father of the steam plough," and also to establish a no less important question as to what is public property in the steam ploughs now at work in our fields, and for which farmers are called upon to long prices.

Mr. Pinkus had two patents—the above that preceded McRae's, and another in 1840 (No. 8,644). In neither case does he lay any claim to novelty in the construction of his ploughs. Indeed, between 1831, when the Committee of the House of Commons gave to the public a memorable report in favour of steam-locomotion on common roads, and 1840, steam-ploughs acted as a prop to intelligent farmers, whenever they met. In "Quarterly Journal of Agriculture," vols. v., vi., vii., the subject will be found discussed in a series of able articles, including a full account of Heathcoat's experiment of steam-ploughing at Red Moss, Burtor Moors (vol. vii., p. 227). In vol. v., p. 480, reference is made to a Mr. Thomas Gibbs, who had a model of "travelling steam-plough," and also a rope system for hauling, or, as it is there called, of "towing" steam-ploughs between two engines, one on each headland. But, however interesting a detailed account of such would be, our limits will not permit us to go farther into the history of the steam-plough and the rights of the public.

Pinkus, in the specifications and drawings of both patents, merely gives a popular outline of what McRae anybody else may do, without infringing existing patents. In other words, the mechanism of his ploughs and of the two sets below a carriage-frame borne on wheels, one set for ploughing one way, and the other opposite, were then public property, and hence cannot be claimed by grasping and monopolising patentees, so as to prevent others improving such mechanism and making of yoking, thereby going ahead and leaving them behind in the march of progress.

In both drawings only a part of the implement is shown, while that portion is not drawn to a scale, so that they are not only mechanically defective, but wanting in detail; consequently, one requires to be acquainted with the progress of things at the period, to understand the drawings of either patent.

The object of the patentee (Pinkus) evidently appears to be the illustration of variety, the two sets in the drawing

ing of the first patent being mechanically unlike each other; while both differ widely in mechanical construction from the two sets of ploughs shown in his patent of 1840. In the former, from reference being made to the handles of plough No. 4, it is manifest that each plough had an individual action, and was held by its own ploughman. On reaching the headland the cope of the plough is screwed up to the frame by the attendant on the carriage, so that the plough would heel out, as in the case of the common plough. The three ploughmen would then fix up their ploughs to the framing behind, as shown in the drawing; then go to the opposite end of the carriage, and let down each his respective plough for the reverse movement. Now, this, at the time, was a very common proposition. In the second patent, again, each set of ploughs is rigidly fixed to a diagonal bar, the four ploughs in each having a common beam. This is neither more nor less than a four-furrow "Somerville-plough," as they were then called, with a common beam under the carriage so as to expedite the screwing-up of the cope, to take them out of the ground and let them into it with equal despatch. This was also a very general proposition between 1830 and 1840, but objected to as involving a sacrifice of mechanical principle, and what is worse, the subjecting the farmer to hard work at each headland.

This highly objectionable feature of rigidly fixing the ploughs, either in a frame or on a diagonal beam, so as to enter together at the one headland, and to be taken out in a similar manner when they reach the opposite, on the Somerville plan, merits a special notice, as it is now being generally adopted. Practical agriculturists have, from the first experiment of the Somerville plough, condemned it without ceremony, owing to the bad work it makes at the headland—the loss being much greater than the saving of manual labour counterbalanced. In horse-culture this objection to the Somerville plough is unanswerable, and under steam-culture a different conclusion cannot be arrived at, either practically or scientifically. We are not insensible to the difficulty of entering and taking out sets of ploughs, three and four being in each set; but that does not justify the sacrifice of mechanical principle, much less the making of bad work at the headlands. With the latter—bad work—farmers are familiar. We never heard it estimated at less than double the ploughman's wages—i.e., about 5s. per acre. It is one of those valid objections to steam ploughing, as now performed, that greatly increases the expense, and thus stands in the way of progress. As to the former—the sacrifice of mechanical principle—this we shall examine under Fiskien's implement, as our remarks will be better understood after noticing McRae's steam plough, which is free from this cardinal objection.

As the writer has determined on having a steam plough made on McRae's plan, exactly similar to the one that was made by the Messrs. Thomas Edington & Sons, Phoenix Iron Works, for the patentee, and successfully tried on the lands of Poissil, near Glasgow, and worked by him on his own plantation estate afterwards, in order to prove that he (Alexander McRae, Esq., of the County of Demerara, British Guiana, planter), is the legitimate father of the steam-plough, a general description of the implement is all that will be necessary at present, a promise being given that a drawing of it, with the usual descriptive details of its mechanism, shall be forthcoming at no very distant date.

Like too many similar projects, McRae's appears to have been patented before it was reduced to practice. This, generally speaking, is a prudent course to pursue, and perhaps upon the whole the freest from objection, were patents less expensive to obtain; for, in the carrying out of such projects, new discoveries are often made in the

manufactory and field, which require a second patent to cover them. And this was the case with McRae's steam-plough, for his specifications and drawings do not wholly cover it. In other words, the improvements made, when his project was placed into the hands of the above engineers to carry out, were such as to justify a second patent; but the exorbitant charges of the Patent Office at that time, we presume, prevented this, and also the general public, from getting the information which otherwise they would have derived from the specification and drawings of the improvements just mentioned. The loss thus sustained by the public may to some extent be yet counterbalanced by placing a model of McRae's steam-plough in the Patent Museum at Kensington; and this national duty, we hope, Her Majesty's Commissioners of Patents will not fail to perform, seeing that they have ample funds at their command legitimately available for this important purpose—one which could not fail to stimulate the progress of invention in steam-culture.

According to the drawing that accompanies McRae's specification, a carriage-frame suspended below the axles is borne on four wheels, two furrow-wheels, and two land wheels, and is furnished with two sets of ploughs, three in each set, placed share to share, as shown in the drawings of Pinkus's first patent, one set having right-hand turnovers, similar to those of the common plough, for ploughing from the engine in the punt to the anchor in the other punt in the opposite canal, the other set having left-hand turnovers for the return movement. In construction the ploughs and plough-beams differ considerably from common horse ploughs, or from those of Mr. Williams' (Baydon, Wilts), Halkett's, and subsequent examples of a similar kind; but in principle they may be said to be alike; and when in action they perhaps more resemble Fiskien's, owing to the beams in both terminating somewhat abruptly immediately before the coulter, than any of the other examples now in the field. The beams, together with the draught-bar and two suspension bars of McRae's ploughs, obviously involve the principle of a "parallel motion," as it was sometimes termed, to which the drawing does not do justice. Long prior to the date of his patent, the principle of a parallel movement was discussed amongst practical farmers who had received the necessary education to do so, such as was taught at Edinburgh, Aberdeen, &c., where hundreds of Scotch farmers were annually thus qualified; and looking at McRae's drawing, we are led to the conclusion that he contemplated the solution of this problem; but if so, he has evidently failed. Into the mechanical details of such a problem it would be foreign to the object of our present series of papers to enter, as its solution has not yet been reduced to practice. Coleman and Sons, it is true, showed something of the kind at Chelmsford, in 1856; but it was defective in several points.

It is but justice to McRae and his patent-agent to observe that, at the date of his patent, drawings were not made with the same accuracy as under the present statute, and his drawing appears rather to illustrate principle than the details of mechanism, so that it would be highly uncharitable, if we are right in this hypothesis, to examine it in any other light, more especially as the invention or principles thus illustrated were immediately reduced to practice, as already stated.

According to the drawing, therefore, the draught-bar and beams when in action would be rigid, thus forming a leverage of the second kind; the fulcrum, when the plough is lowered into action at the one headland, or taken out of the ground at the opposite end of the field, being the draught-pin of the cope by which it is hauled when ploughing. Six vertical bars are bolted to the carriage-frame, three towards each end, each bar being directly

above the body or frame of its own plough. These vertical bars are for the lowering and elevating apparatus, which consists of six vertical suspension-bars, working each in two guides, the lower end being fixed to the frame of the plough, apparently a little behind the centre of gravity, and actuated at the upper end, which passes through a slot by a lever. Near the one side, and towards the top of the upright bars, are seen the pins, upon which the levers work. Below the frame of the carriage are four small pulleys for guiding the draught-rope or chain, and keeping it from getting entangled with the ploughs; and upon the carriage above is shown a hand-rail, for the accommodation of the ploughman.

The canals in Demerara, we may observe, "run parallel to each other, and at a distance of two hundred and forty to three hundred and sixty feet apart," quoting from McRae's specification.

The improvements made in McRae's steam plough, already referred to, are chiefly these. Instead of four carriage-wheels, as previously adopted by Pratt and Pinhas, and subsequently by Fischen, viz., two furrow-wheels and two land-wheels, two main central wheels are substituted, as subsequently adopted by Fowler and Grig, one on the furrow and the other on the land between the two sets of ploughs, while two smaller wheels are placed one at each end of the carriage-frame, now lengthened beyond the ploughs, so as to enable the implement to cross the open ditches between the canals, used for bottom irrigation in dry weather and surface drainage in the rainy season. These alterations were essentially necessary to the successful working of the implement in the low-lying plantations of British Guiana. The other improvements have reference chiefly to alterations in the plough-beams and apparatus for lowering and raising the ploughs.

We have already expressed a high opinion of the principles upon which M'Rae's steam plough is constructed; and it is but just that we should here observe that the opinions thus entertained are not based merely upon a knowledge of mechanics, but also upon its successful working near Glasgow, and also of the equally successful working of

Halkett's ploughs, made on exactly similar principles, the one experiment corroborating the other, thereby proving the soundness of the conclusion. Leonard Wray, Esq., in his valuable work, "The Practical Sugar Planter," published so far back as 1848, by Smith, Elder, and Co., 65, Cornhill, London, speaks in the highest terms of the triumphs of steam ploughing in British Guiana, as the following quotation will show:

"As the plough arrives at the extremity of the field, the two boats move on the required distance; then the motion of the engine is reversed, and the plough returns, so that by this simple arrangement the ploughing of an estate is accomplished most expeditiously. The Demerara planters deserve a very great deal of commendation."

We might quote other authorities from our West India colonies, but the above is sufficient. That M'Rae's steam plough is capable of improvement will readily be granted. Indeed, this is the reason why we are determined to have it constructed anew, and hauled by wire ropes.

An account of the experiments with M'Rae's steam plough "on the lands of Posail, near Glasgow," as referred to above, will be found in the *Mark-lane Express*, April 27, and Nov. 16, 1840, and "Farmer's Magazine" for June, 1840, and also in the number for December of the same year, the former quoted from the *Glasgow Herald* and the latter from the *Glasgow Courier*. Both reports pronounce the experiments "eminently successful," the expression of approbation just quoted being from the former paper (the *Herald*). Temporary canals were formed to test the working of the two punts, the one carrying the engine and hauling-drum, and the other the anchor-pulley as well as that of the implement. As might be expected near the enterprising city of Glasgow, a large concourse of the landowners and farmers of the neighbourhood were present at the trial, as also engineers, including the writer, who was in Glasgow at the time. The highest praise was justly bestowed upon Mr. M'Rae and the Messrs. F. Edington and Sons by all who were qualified to pronounce an unbiassed opinion on the subject.

ENGINEER.

THE FENS.

When you have learned how cleverly and perseveringly the Fenmen have saved their territory from the waves of ocean, and the overflow of tidal rivers, and how they cultivate with peculiar processes a soil that (strangely enough) is largely of vegetable origin, you find, still further, that a rare interest attaches to the land itself, and that great problems in the science of our world's history may be solved by a study of what the Fen labourer turns up with plough and drain tool. The black-land farmer is continually digging out trunks and roots of a woodland that ages ago flourished upon the low flat; and he naturally wonders how trees could have grown upon dry ground, where, at present, an artificially drained bog overspreads them; how the surface could have been clear of inundation, yet at a level not far above that of the sea at low water; and how the forest was overthrown, and a state of drowning succeeded to one of natural dryness and verdure. That no system of embankments and of either steam or wind drainage secured the drainage of terrain ages before the Saxon times, everybody must acknowledge; and the inevitable conclusion is, that the whole country must have subsided several feet, or else that the rise and flow of the tides in the German Ocean have altered several feet in altitude. Probably most Fen farmers have speculated occasionally upon these strange revelations of their deep drains; and

more than once I have heard it suggested that some geological convulsion or "great earthquake" lowered the Great Level "when Great Britain was separated from France;" the chalk cliffs of Calais opposite those of Dover, and the peaty plains and marshes and subterranean forests of Belgium and Holland opposite to those of the Great Level (divided only by a shallow sea), apparently testifying to the original union, and continuity of our island with the continent. Some people, again, ask whether the alteration of relative levels of land and sea did not occur at Noah's deluge? Now, this is not the place in which to enter upon the whole of this extremely large subject, but one or two conclusions of geological science will be of some service in elucidating the mystery. Perhaps there may be in existence some marks left by the Noachian flood; but at present none have been found and identified. As for elevations and depressions of extended areas of country, many such changes are taking place in our own day. A large part of Sweden is proved to have been rising at the slow rate of 2 to 4 feet per century. Scotland has been uplifted by a more sudden movement, as evidenced by the ancient beaches now marked around her shores at heights 25 to 40 or more feet above the present high-water mark. And this change occurred since the country became inhabited by mankind; one

among other proofs being the discovery of some stranded whales, with a harpoon of deer's horn, many feet above the high-water line in the Firth of Forth. Similar changes of level of elevation and of subsidence no doubt originated the alternating conditions of woodland and watery waste in the remote history of the Fen country. But geology carries much farther back than this. Long before these minor oscillations of level occurred, almost the whole northern hemisphere had been submerged beneath an arctic sea, and our mountain summits were islands. There was a period of re-elevation and re-emergence; an age of glaciers in our valleys; a time of return to temperate climate. The marks of that tremendous era remain in beds of "till" or boulder-clay—clay containing stones and fragments transported from immense distances upon icebergs, still bearing the scratches and grated marks of the ice; beds of gravel washed and rolled by floods; river-valleys eroded; terraces left upon hill-sides; and innumerable other traces and spoils of the catastrophe. The drift-clay and the gravels of that period are widely distributed in our eastern counties; they are found under the alluvial (or more recent) clays and peats of the Great Level, upon the islands within the district—as at Ely, March, Whittlesey—and upon the borders of the Fens, as at Tatterhall, Deeping, &c. Old as the Fen peat and its buried trees may be, these stony clays and gravels are immensely more ancient, and formed by causes not now in action in our part of the world; whereas, the fen and marsh lands were accumulated by agencies which are still in operation, or might be, with a slight alteration in the levels of land and sea. Of late, scientific explorers have found what they believe to be evidences of the existence of mankind in the remote age when the drift-gravels were deposited; the principal relics consisting of so-called "flint instruments," knives, and spear-heads, rudely shaped of chipped flints; and possibly these singular antiquities may be discovered also in the gravels of Deeping, of Tatterhall, and south and west of Lincoln. It is a question of the greatest interest, how many years have elapsed since these gravels were accumulated? Can it be proved that men have been upon the globe for a hundred thousand years? And the position of the peats and clays of the fens above these drift-beds is such, that considerable light may be thrown by this means upon the probable time intervening between the glacial epoch and the historic period. I may here observe that all respectable and religious people should regard with great interest the discussion of this subject of man's antiquity, as testified by geological evidence; for though the Bible chronology differs in different versions (the Greek, which Christ always quoted, placing Adam some fifteen hundred years backwards than the Hebrew does), the utmost limit to the age of our race is fixed by the sacred Scriptures at some ten thousand years, more or less; and we are concerned in maintaining, if possible, that no relics of mankind come from any date beyond that. I believe that the fen strata, in regular series of superposition, afford the means of estimating the antiquity of the drift beds, and thus of settling the controversy between Moses and modern philosophers.

Not that you can in any one locality pierce with an auger through all the various layers of peat and clay, each of which tells its tale of a former surface; but the evidence of one layer being of older, or of more recent forma-

tion than another, is seen where it may chance to dip under or overlap another. Thus, at Tydd St. Mary's, near Long Sutton, a deep cutting showed that the embankment, traditionally said to have been formed by the Romans, and certainly of more ancient date than the Saxon times, stands upon a stratum of "old marah," or tidal warp soil, a few feet in thickness. In other parts of the Great Level this same stratum of brown clay and sea-sand is about twenty feet thick; whence it is clear that a considerable time must have elapsed between the period when its necessarily slow deposition commenced, and the date of its inclosure from the sea by the aforesaid bank. Immediately under this stratum lies a seam of peat, or partially decayed vegetation—the surface (mainly) of aquatic plants and water-loving trees, that was, at least, subjected to the marine invasion, and the thick coating of "old marah" land. Beneath the peat comes a few feet thickness of a soft greasy clay—a muddy sediment from water partly salt and partly fresh—testifying of deep flooding before vegetation occupied the site. Next, in the downward series, is a second layer of peat, with inclosed plants and trees; and the roots of these stand as they grew upon a second bed of the soft clay at Tydd not yet sunk through. Now, these two peats, probably differing only a little in relative age, are traced inland, retreating from the old Nene estuary till the stratum of old marah alluvium thins off from above them, leaving the peat at the surface to spread out as the black soil of the Bedford Level. The antiquity of this peat is shown by the Roman road lying upon it across the entire Level, from Denver in Norfolk to March and Whittlesey. The peat was formed by the decay of a forest of magnificent timber, amongst which roamed wild beasts, as the aurochs and boar and beaver; and remains of the aboriginal men who made canoes and bronze and stone hatchets in Ancient Britain are found among the buried trunks and roots. The soft clay is found in almost all parts of the Great Level, in places 20 feet in thickness; so that the district must have been once a bay, for a long time before the muddy bottom was upheaved for oaks and firs to flourish upon. In other parts of the Fens the soft clay has been sunk through, as at Boston, in the river Witham, in the fens between the Forty-foot drain and the hills north of Bourn, also in the North and Middle Levels. In some localities this clay reposes upon the original bottom of old geological strata common to other parts of England; in many places it rests upon thick beds of boulder clay, gravel, and sand. But in the localities above-named, the soft clay overlies another subterranean forest, or third peat, consisting of very large trees rooted in the boulder clay of the glacial era. And to mark the extreme antiquity of this woodland, underneath Deeping Fen it has been found covered by drift gravel. This, then, is the series of strata lying ready for examination. As yet, no human relics have been exhumed from any stratum below the two upper peats, and thus a long interval of time is interposed between the earliest presence of man and the age of the drift gravel. Further study will enable sound conclusions to be drawn.

J. A. C.

P.S.—I should be obliged to any Fen correspondent who, in the interests of science, could furnish him with any observed succession of beds or curious remains.

ANNALS OF STEAM CULTURE.

One bright day in the middle of last month I alighted from the train at Hitchin Station, on the Great Northern Railway, and soon measured a distance of three miles over a pleasantly undulating country on the old London road. A gentle rain had laid the dust, and nature seemed only just to have waked up to enjoy the rays of the sun as they played prismatically amongst the glittering globules of water that trembled on every leaf, grass blade, and flower-petal. The fresh breeze of the early day, sweet as the breath of kine, was perfumed with violets and that refreshing smell which arises from wetted moss.

My visit was to Mr. Roberts, of Armahoe Bury, who is farming a fine stretch of land between the estates of Lord Dacres, the Marquis of Salisbury, and Sir Edward Lytton. It is high, and commands from all points a splendid view. Its geological position is favourable, being just on the edge of the chalk range, which extends from the Thames at Goring with a north-eastern strike to Norfolk, where it forms a useful and defiant promontory to the waves of the North Sea. Over the chalk at Armahoe Bury lies a rather thick stratum of water-worn drift, which constitutes a fine, porous, workable soil, with complete natural drainage. In sinking wells, the chalk is always found a few feet below the surface.

This farm, which consists of about 630 acres of arable and 40 of grass land, came into the occupation of the present owner in the year 1849. He purchased it in 1858.

At some period, not very remote, the whole of this estate was probably covered with oak, beech, and ash timber, together with its usual accompaniment of underwood. I should suppose that previous tenants, gaining permission from time to time, have felled the trees here and there over nine or ten acres of ground (for that was the average size of the fields), grubbed up the roots, and obtained little enclosures surrounded by belts of wood, varying in thickness from five yards to several chains. For instance, the largest field on the farm, comprising 108 acres, lay until lately in twelve fields, shut in by broad lines of timber.

If these trees ever were planted, it must have been when wood was as necessary to the cottars and farmers of England as it now continues to be to those of France and Germany. Now that the railway has cheapened coal, and brought it to the doors of the poor at 18s. a ton, wood no longer holds its position in the market, being out-bidden by the fossilized forests of another age. There is no longer a remunerating sale for the faggots of the woodman, whose winter vocation in these parts is now nearly at an end. At the present time, twelve years' growth of wood (rates, rent, and taxes being deducted, rent being 7s. an acre), generally sells for only 25 an acre.

It is no way surprising, therefore, that landowners should seek to bring their land under crops of greater profit. Several gentlemen in Hertfordshire, and in other parts of England where the value of wood has been depressed, have proceeded to fell their timber and lay out the land for cereal cropping. Had greater caution been displayed some of them would have fared better, because it by no means follows that land, which, under wood, yields a poor return, will yield a good one under open field culture.

Mr. Roberts very wisely first satisfied himself what sort of wheat and barley such land would produce when once cleared. Before purchasing the property, while yet a ten-

ant, he obtained permission to grub up several acres of wood on different parts of the farm, and here he tested the quality of the land for the growth of cereal crops. Ascertaining that the investment in labour for the transformation of the land from timber-bearing to grain-bearing would be highly satisfactory, he set to work the moment he came into possession, employed the whole of the surplus labour of the neighbourhood, emptied the workhouse of every available man, increased his horse power, and gave his undivided attention to the work of clearance.

For months and months the farm presented the appearance of those parts of the backwoods of America which echo to the pioneer strokes of civilization. Down crashed the great trees which had built up their solid limbs from invisible gases, sucked in its passage from the filtering air. The blow of the axe fell on the ear from every direction. The varied movements of some two hundred men—the friction of bone and muscle—filled the air with the cheerful hum of labour. The horses, urged on by the cries of their drivers, dragged the great roots to the lurid fires, where the captured elements of air were once more liberated; the timber wain piled with huge bolls was hauled with great labour through the rutted soil; and the plough performed its perilous first journey through the enfranchised earth, to mix the charred remains of the fallen giants with the peat bed which had been gathering about their roots.

It is thus that in three or four years Mr. Roberts has reclaimed 140 acres, at an expense of £11 10s. an acre. I draw attention to the circumstance as to one which bears directly upon the work of preparing a farm for steam culture; and a few remarks upon such a subject are, perhaps, quite as useful, and quite as appropriate, as any description of what has been accomplished by the steam-driven implements of tillage. There are thousands of acres of wood in this country which would pay for clearing, and thousands which, in the present state of the grain and labour market, would not. Wherever such works are commenced, let it be with due caution. Mr. Roberts' application of the old maxim, "Taste and try before you buy," may well be borne in mind.

These 140 acres of cleared land exceed the best expectations formed of them. Since the timber was removed they have been ploughed deeper and deeper, and, without manure, have borne increased crops. The owner has not as yet risked the steam-plough amongst the roots which still lurk in these portions of the farm, but this year he intends to commence. Of this tract, the largest part is sown with early Emperor peas, for the sake of getting rid of a woodland weed which infests the land, and proves fatal to clover. The steam-share waits till these peas are off in July, and then will arrive the dawn of better things at Armahoe Bury.

The set of steam apparatus worked by Mr. Roberts was ordered of Mr. Fowler, in the spring of 1860. It arrived while he was engaged in all this labour of preparation, and he made comparatively scarcely any use of it. Still it proved a very valuable acquisition. Fallow and other work was in arrear, for the cleared land proved rough work at first, and absorbed an excess of horse-power. Four horses were required to plough half-an-acre a-day, and not unfrequently have Howard's strong iron P P ploughs been returned to the Bedford Works for repair, bent into all manner of shapes, and thoroughly de-

moralised. For the same reason seventeen horses are now kept, which is really more than would be needed but for the circumstance just named.

The tackle first used was that in which three sheaves were carried beneath the boiler, but for these were substituted the clip-drum. It is now thoroughly equal in all respects to the apparatus sent from the Leeds manufactory to-day, and in the next two years will I doubt not develop splendid results. The belts of wood are lowered, and most of the hedges are abolished. The fields lie open and square, divided into plots of forty or fifty acres; the slopes for the most part are gentle. A good hard road 1½ miles long runs through the farm, and, moving along that, the engine can work right or left. Everything looks promising for a beginning.

With what had been done by the tackle its owner expressed himself fully satisfied, and certainly the land I saw prepared for roots presented a fine sight. Two ploughings and one cultivation had alone sufficed to produce a fine, deep

seed-bed. Between September and November 72 acres of land were ploughed for roots. The tackle was drawn at the end of February from winter quarters, and since that date 124 acres have been worked with plough, digger, and cultivator. The plough has been worked at the rate of six acres per day, the cultivation (in the open field of great lengths) at the rate of one acre per hour. Mr. Roberts pretends to nothing wonderful as to speed, but he prides himself upon the efficiency of the operation: he will have the work well done, and as a proof of this a neighbour requested to have one of his fields ploughed in the same way as Mr. Roberts was ploughing his own, and offered to pay him £1 per acre for the single operation.

The expenses of working are, I ascertained, much what they are in other cases already recorded. As to repairs, the rope, of course, seems most to blame. Since the first rope in 1860, 450 yards were purchased in August 1861 (now half worn), and another 850 since Christmas. The original 800 yards of rope are *nil*. F. R. S.

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.

The anniversary festival of this Institution took place on Wednesday evening, May 27, at the London Tavern. There were about 100 gentlemen present; the chair being taken by the Earl of Dartmouth, one of the Vice-Presidents. Among the company were Alderman Mechi, Mr. Wren Hoskyns, Mr. Fisher Hobbs, Mr. J. Claydon, Mr. J. Collins, Mr. T. Hudson, Mr. C. S. Cantrell, Mr. R. Garrett, Mr. G. Shackel, Mr. J. Druce, Mr. S. Druce, Mr. E. Purser, Mr. W. Boards, Mr. G. Russell (Kent), Mr. Brown (Upcott), Mr. T. Scott, Mr. Bazin, &c., &c.

After the toast of "Her Majesty the Queen, Patron of the Institution," the Chairman gave "The Prince and Princess of Wales and the other members of the Royal Family."

The next toast was "The Army, Navy, Militia, and Volunteers," which, like the preceding toasts, was received with customary enthusiasm.

The CHAIRMAN then proposed "Prosperity to the Royal Agricultural Benevolent Institution." He said he could not help thinking it was to be regretted that some one who had had more experience of agriculturists did not occupy the chair on that occasion; but perhaps those who did him the honour to place him in that position thought that for the festival of a young society a young agriculturist was preferable to an old one (cheers and laughter). Although a young agriculturist he was by no means inexperienced in regard to what concerned the tenant-farmers of this country. From a very early period of his life he had had friends among that important class of society; he had known some of them intimately; and he believed that, like every other English landlord who had cultivated their acquaintance, he had been the better for it (cheers). A few years ago landlords sympathised with tenant-farmers, because they believed their interests to be injuriously affected by the course of legislation. The struggles of those days happily were now over, and he only alluded to them for the purpose of remarking that the agriculturists of this country had emerged like men and Englishmen from the trials to which they were subjected (cheers). A few years ago British agriculture was supposed to be on its last legs; now they might congratulate themselves on the fact that never was there a better show of stock and implements than would be seen at Worcester in 1863 (cheers). So long as Englishmen met adverse circumstances as the agriculturists had done, so long would England deserve to be what she is. But they must not forget that in the pursuit of agriculture there were great reverses of fortune (Hear, hear). There were adverse circumstances connected with the elements and other powerful influences which no skill and no energy could control. In turning over the pages of the Society's last report he found cases which, though recorded in a dry and business-like manner, showed strongly how sad were the reverses to which tenant

farmers and their families were exposed, and, seeing that they arose from no fault of the sufferers, it was the duty of their fellow-countrymen, and especially of agriculturists, to step in and hold out a helping hand (cheers). It was for that purpose that this society was formed. Long might it exist! Long might it continue to extend its benefits to those who were in need of them! Of course they did not wish the number of such persons to be large; but they did desire that to the appeal of those who were fit objects for assistance the committee might never be compelled to turn a deaf ear for want of adequate funds (Hear, hear). He believed the worthy Alderman on his left—and he could not help observing, in passing, that it was an immense advantage to that society, as well as most creditable to that gentleman himself, that it should have such a friend as Alderman Mechi (loud cheers)—He believed the worthy Alderman would agree with him that there was no more painful position than that of the widow of a respectable farmer, who found herself suddenly deprived of the support of the head of the family, and left in a struggling and almost destitute position; not willing to give up her holding, and yet unable to carry it on properly. Under these circumstances, how very desirable was it that the widow should have a pension like those granted by that society, instead of being left to seek a refuge in the workhouse! (Hear, hear). He could not help congratulating the assembly on the great advance which the society had already made in almost every county in England. He trusted that the support thus received would be widely extended, and that counties which had not yet done their share would not be wanting in that respect in future. London was well represented on that occasion by Alderman Mechi; and as commerce and agriculture now went hand in hand, let not agriculturists be wanting in their duty to their own class (cheers).

The toast was drunk with great enthusiasm.

The Rev. W. ROGERS, who announced himself as "a Cockney Clergyman," said, in proposing "The Chairman," he presumed that the reason why he had been selected for that duty was that his parish happened to be in the district of Smithfield, where he had laboured to some extent to improve the religious condition of the drovers. As regarded the Chairman, he had had the pleasure, he said, of knowing him for many years, and he knew that he felt deeply interested in everything connected with agriculture—a feeling in which Lady Dartmouth participated (cheers).

The toast was drunk with great cordiality.

The CHAIRMAN in returning thanks, adverting to the concluding remark of Mr. Rogers, observed that whatever he knew about the points of an animal he had learnt from Lady Dartmouth (cheers and laughter); adding that her ladyship had a remarkably correct eye.

Mr. C. W. HOSKYNs proposed "The Agricultural Societies of England, Ireland, and Scotland," coupling the toast with the name of Mr. Fisher Hobbs. He observed that that was emphatically an age of Societies, and that none had a more important bearing on the progress of improvement than those referred to in the toast. Among those who had laboured for the advancement of practical agriculture, there was no one more remarkable than the gentleman with whose name the toast was associated. He was a most useful and valuable member of the Council of the Royal Agricultural Society (cheers.)

Mr. FISHER HOBBS in responding said, he was sure the members of the agricultural societies generally rejoiced in the existence and progress of a Society formed expressly for the assistance of unfortunate persons belonging to their own class; and he hoped the Society would receive from them increased support in the pursuit of its excellent object.

Mr. GEORGE COOK proposed "The Arts, Manufactures, and Commerce," associating the toast with the name of Mr. Alderman Meechi, and observing that in everything useful, practical, and benevolent, the worthy Alderman stood pre-eminent.

Alderman MEECHI, who was very cordially received, in responding took occasion to advert to the origin of the Society. He said he claimed no credit for having founded it. The idea arose from feelings which passed in his mind in connection with a touching case of agricultural distress. A lady at whose house he had visited, and whose hospitality he had enjoyed, was reduced to poverty. He was thus led to ask himself "Is there really no charity connected with agriculture—the greatest and most important interest in this country—is meet such a case?" There was none. He then asked himself another question, namely, "Does the non-existence of such a charity arise from any want of benevolent feelings in the breasts of British farmers?" He knew that this was not the case. He knew, from observation and experience, that farmers, as a body, were not only hospitable, but charitable; and that all that was needed was some medium through which their bounty might be dispensed. Such was the train of thought which led to the founding of this institution. He was convinced that no interest in the country could raise so large a sum for charitable purposes as the agricultural interest; and for himself, he would now promise to do his utmost to bring to the next anniversary a list of subscriptions amounting to £500 (cheers). Some of his old friends appeared to think he had done great injury to the farmers. Supposing that to be the case, the best plaster that he could apply to the sore was perhaps to labour earnestly for that institution, and endeavour to obtain for it increased support.

Mr. JOHN CLAYDEN proposed "The Treasurer (Major-General the Hon. A. N. Hood), the Chairman (Mr. C. W. Hoskyns), and the executive council."

Mr. C. W. HOSKYNs returned thanks.

The remaining toasts were "The Stewards," coupled with the name of Mr. C. S. Cantrell; "the Secretary" (Mr. Charles Shaw), and "the Ladies."

The donations and subscriptions announced during the evening, including donations of £25 from Her Majesty the Queen, and £20 from the Earl and Countess of Dartmouth, amounted to about £3,750.

On Wednesday, June 3, this society held its Annual General Meeting at the London Tavern, to receive the Secretary's report for the past year, and to elect officers and pensioners. Mr. CHANDOS WREN HOSKYNs, President of the Council, in the chair.

Mr. CHARLES SHAW, the Secretary, read the following

report, which was unanimously adopted and ordered to be printed:—

"I have the honour to lay before you the following report of the operations and finances of the Institution, for the year ending December 31st, 1862. It will be remembered that the first election of pensioners took place on the 2nd of May, 1861, on which occasion an annual sum of £455 was appropriated to the maintenance of twenty pensioners. At the second election, on the 11th of June, 1862, a further sum of £264 was voted by the Council for the maintenance of thirteen additional pensioners, making up the total number to thirty-three, and the total expenditure to £719. The former figure has by deaths been since reduced to thirty, which is the actual number of pensioners now on the books of the Institution. With respect to the financial position of the Institution, its favourable progress affords matter of congratulation. The donations amounted to £1,148 1s. 4d., being £253 8s. 6d. in excess of last year; and the annual subscriptions reached £1,881 16s., being an increase of £483 0s. 6d. Both items of course testify to the spreading recognition of the importance of the Institution. But the steady increase of the latter is certainly highly satisfactory, inasmuch as subscriptions represent what may be called the constant element of progress, while donations are subject to many fluctuating influences, too obvious to need mention. In addition to the balance of £185 5s. 2d. from last audit, £153 11s. 3d. have been received from dividends, making the total receipts of the year £3,318 13s. 9d., while the entire expenditure, notwithstanding the gradual enlargement of the Institution, has been only £3,849 8s. 7d., of which £1,465 9s. 9d. have been devoted to the purchase of stock, leaving a credit balance at the bankers of £469 5s. 2d. Although not directly connected with the present financial statement, the patronage recently conferred on this Institution by Her Majesty the Queen, is a subject to which the Council cannot but refer with pride. Neither will it be out of place to record their expectation that the influence of this most gratifying event will insure a still more satisfactory state of affairs for the next report. The best test of merit is success, and no success can be more patent than that to which royalty has set its seal."

Mr. Fisher Hobbs, Mr. T. Pain, and Mr. John Naish having been unanimously elected members of the Council, the following retiring members were re-elected: Mr. Scott, Mr. Sanday, Mr. Shackel, and Mr. Torr.

After the thanks of the meeting were voted to Mr. Chandos Wren Hoskyns, Mr. Scott, and Mr. Charles Shaw the Secretary, and the Honorary Local Secretaries, the Council proceeded to the election of pensioners, and the following candidates were declared duly elected:

Four male pensioners at £26 each per annum.

	Age.	County.	Votes.
John Ward.....	65	Norfolk.....	430
Thomas Taverner....	73	Essex.....	290
Henry King.....	59	Cambridge..	212
John Cottingham....	72	Suffolk.....	179

Two married pensioners at £40 each per annum.

William Toyn.....	80	Hertfordshire...	368
Martha Toyn.....	78		
Edward Davis.....	77	Dorsetshire..	322
Elizabeth Davis.....	74		

Four female pensioners at £20 each per annum.

Christiana Friend....	86	Berkshire.	Nominated by Her Majesty.
Elizabeth Batten....	67	Hampshire..	375
Ann Brokenbrow....	58	Wiltshire....	342
Rebecca Browning....	66	Essex.....	303

SEWAGE.

EVIDENCE GIVEN BEFORE THE SELECT COMMITTEE OF THE HOUSE OF COMMONS.

I must now bespeak attention to a continuation of the evidence upon the utilisation of town sewage as given before the select committee. We were considering, under the 2nd section, the value of TOWN SEWAGE, as shown by its effects on LAND and CROPS; the crops for which it is suitable; together with the quantities applied, and mode of distribution. I summarised the evidence of three members of the Royal Sewage Commission—Lord Essex, Professor Way, and Mr. J. B. Lawes—all in favour of a large application of sewage upon small areas; also that of Professor Frankland and Dr. R. A. Smith; and I now proceed to deal with the facts and opinions drawn from Mr. Alderman MECHI, under examination. This gentleman stated that he had applied liquid manure to the cereal crops, the leguminous, pulse, and root crops, to natural pasture, and Italian rye grass. The advantages to the corn crops were generally indirect—that is, the root, clover, or other green and “greedy feeding crops” were manured with sewage, which on ordinary land is the safest mode in which to administer all manure, and then the grain crops would follow with less danger of their suffering from over luxuriance. “But,” said he, “were my land recently taken and poor, I should desire no better or more immediately-acting manure than the sewage of a town.” As to the durable effect of sewage he gave the following instance: “There is a field of five acres opposite my drawing-room window: the land has ever been considered a very poor, miserable, yellow plastic clay. After drainage I still could not succeed in raising a good crop of grass on that field, although sown with the very best seeds; the indigenous bad seeds choked the good grasses, and I had no result; but when I irrigated those five acres with sewage the effect was almost immediate, certainly within six months a better class of grasses was produced, and ever since I have had heavy crops of grass and hay, improving the condition of the animals, and giving an infinitely better quality of milk, cream, and butter. This is so obvious this very day, that on my lawn, which has not been irrigated, it is a drab colour and miserable-looking; on the pasture immediately adjoining it is rich, luxuriant, and of an intense green: it has shown that effect for the last eight or nine years.” Were the difference in the rent of the unsewaged and sewaged land to be estimated, it could not be set at less than £3 per acre increased value. Under this head it is proper to repeat the evidence already adduced in the first article, relative to the beneficial action of simple water irrigation upon the soil and the plant, together with the effect of sewage to raise the temperature of the soil, and thus promote the growth of the plant. For details I refer the reader back to Mr. Mechi's evidence under section 1. He said he had never had sufficient manure to mix with the 60,000 gallons of water at his daily disposal; but that had he the command of town sewage, he would lay down a large area of land to grass, which would yield not the five tons of green grass, which may be taken as the average of the kingdom, but that amount quintupled and more than that, the chief inconvenience of which to the farmers generally

would be that they would have to invest more capital in cattle to feed it off. He would be willing to apply 2,000 tons an acre of London sewage on rye grass, at 2d. a ton. For this outlay of £16 15s. an acre he would increase the grass crop to 25 tons (or six tons of hay), which in money might be represented by £24. After two years' rye grass, heavily dressed, he had taken the following crops in succession without extra manuring: Two of barley, two of wheat, one of seed tares, one of seed clover. He could not tell the amount of sewage used per acre on his own farm. On this farm, consisting of 170 acres, he stated that were 2,000 tons an acre of London sewage offered to him, he would require it on less than 20 acres, and that in process of time it would so increase his manurial power for other portions of the farm, that the area would have a tendency continually to decrease rather than to increase. Respecting the quality of sewaged grass, Mr. Mechi said that though it appeared coarser, it was in fact far more fattening than unsewaged or merely water-irrigated grass. He saw no practical difficulty in the conveyance of the sewage of London forty or fifty miles, with the supply of 30,000,000 gallons of water daily from Loch Katrine to Glasgow now in view. Still, as to distance, he would be guided by considerations of economy. He did, however, object to the wasteful return to 20,000 or 30,000 acres, as now proposed, of the manurial elements resulting from the consumption by the people of London of the produce of 6,000,000 of acres. At Croydon the area employed is not large enough to absorb the sewage: it runs to waste, and does, as in such cases it must, prove a nuisance to the neighbourhood. Used in so large a quantity as 8,000 tons an acre he thought it productive of injurious effects to the air and the stream into which it might ultimately flow. He considered 200 or 300 tons an acre an excellent dressing for a cereal crop. The mode of dealing with the five-acre field already alluded to be stated as follows. “We irrigate it twice during the winter, and put on sewage equal to a rainfall of 1 inch—that is, 100 tons an acre. We do that twice; then allow the crop to stand for hay, first being fed up to the 7th of May. In June it is cut. Subsequently it is manured with 2 cwt. of guano, washed in with sewage, and it then yields an abundant after-crop of cattle feed.” Land has to his knowledge increased eight times in value by the simple process of irrigation alone. At Croydon land not worth more than £2 an acre rent has been raised to £5. The sewage from 20,000 people is there used, after filtration over 300 acres, by the open system of irrigation. Increasing the rent of the 300 acres, as it appears to do by £2 10s. an acre, it would seem that the sewage from this population is worth about £1,000 per annum, or 1s. a head; but it must be remembered that it might be applicable to a much larger area, since, filtered as it is, the river is so fouled by what runs into it, that actions are pending against those who thus damage the water. He considered that, in justice to the land and to the sanitary condition of the people, the produce of 6,000,000 acres when consumed should not go on a less area than 500,000 acres of land.

Professor VOELCKER was next examined. He considered that some portions of Mr. Mechi's land unsuited to sewage. Soils which allow the sewage to pass coloured to the drains are not in proper state for its reception. This is generally the case with heavy clays in dry weather, when the sewage passes away through the deep cracks, and does not get mixed with the soil. Sewage is principally applicable to grass land; in dry districts, in light soils, perhaps it may be used for green crops—root crops—but by no means in all kinds of soil for root crops. He admitted the possibility of changing the nature of the soil by drainage, and also that where sewage was freely applied the land would have little opportunity to crack. One reason he adduced for large quantities of sewage being needful was this—seeing that dry manure or dung can be distributed with judgment, and that sewage cannot be applied just at the place required, but goes through the whole soil, it is necessary, in order to produce an effect, to increase the dose proportionably. He objected to the sewage being valued at 2d. a ton; he said that was not its practical value. It was so estimated by comparing it with the constituents of the ordinary dung, which can be administered and kept just on the surface, while a great portion of the liquid manure sinks away out of reach. "By applying a limited quantity of the liquid, it penetrates a large body of the soil, incorporating a large body of soil with a small quantity of real fertilising matter." Could that small quantity be extracted, and applied as a top dressing, the small portion of soil which received it would be well manured, and a corresponding effect would be visible in the crop. "When we apply a large mass, say 7,000 or 8,000 tons of sewage to a soil which is naturally porous, we incorporate with a large body of soil a considerable quantity of solid, real fertilising matter. By using such large doses upon grass crops grown on a poor soil, these solid manuring matters which are disseminated through a large body of soil by capillary attraction are brought within the reach of the rootlets. The evaporation which takes place from the leaves of grass-crops is very considerable; the moisture from a considerable depth is drawn up, and with it all the solid matters dissolved in it." Upon these theoretical grounds the learned Professor preferred an application of 8,000 tons to 200; and upon these alone could he account for the slight result which follows the distribution of such small quantities as 400 tons an acre. He had "nowhere seen it produce any decidedly remunerative effect." He had made no personal experiments, and knew of none save those carried on by Mr. Lawes which could be considered as a safe gauge of the agricultural value of sewage. When asked whether he found the soil more ready to retain the manurial contents of a strong or a weak fluid, he stated that when the solution was very strong a large portion will pass through; when it is moderately strong, the soil will remove its maximum proportion; but that in a very weak state the soil possesses little power over it. Ammonia and other fertilising matter absorbed by the soil is in danger of being removed again by a large quantity of water. He could only explain the fact of Lord Essex having produced an increased crop of wheat, worth £2 7s. an acre, by the application of 184 tons of sewage, on the supposition that it was applied at several different times, so as never at any period to sink below six inches of the surface. He was acquainted with every attempt that had been made to extract a dry manure from sewage; they all proved failures, and he saw not the slightest hope of any success in this direction.

Mr. W. S. TILLY, Borough Surveyor of Birmingham, was

next examined. He spoke of a Mr. Burbidge, who received the sewage upon his farm direct from the mains. It has produced the most enormous crops of grass. He puts it on at the latter end of February; he has a good crop at the present time (April 7). He will graze it late, and have a crop of hay before any of the farmers in the immediate neighbourhood. For several years he has used it over sixty acres, and upon a portion of this area pays a rent of 14s. an acre; he would pay a rent upon the whole, but having given particular facilities for the construction of sewage works he has not been pressed for a rent on the whole. Upon this sixty acres had been thrown, solid and liquid mixed (that is, unfiltered), 5,454 tons daily, continuously for one month.

Mr. R. FOWLER, Jun., a land-agent and tenant-farmer near Birmingham, occupied land from half-a-mile to two and a-half miles from the sewage tanks. The number of acres under irrigation are sixty. This was at first irrigated by the flood waters of the river Tame, and then, in 1853, by a regular system of irrigation, when the sewage of Birmingham was first discharged into that stream. The land was fitted for irrigation by an outlay of £9 10s. per acre. His experience led him to esteem very highly the properties of pure water, but he could see scarcely any perceptible results in his crop since half the cesspools of Birmingham were broken up and were discharged into the Tame. The water in the neighbourhood of the outfall of the sewers is "too strong," and the water lower down is more valuable for irrigation. He would as soon have the water from the river as the fluid overflow of the sewage tanks direct. He did not think Mr. Burbidge's meadow, "which is floated from the sewers before the sewage-water reaches the tanks, is more valuable than it was twenty years ago, when it was floated from the stream (which stream, by-the-by, was confessed always to have been a somewhat foul one). He aspired to no chemical knowledge, but he thought there might be too much of a good thing, and stated again that the water two or three miles from the fall of the sewage into the river (stronger than it was ten or fifteen years ago) was more valuable for irrigation. Looking at this as an agricultural question only, he thought it best to let the sewage pass into the river, and irrigate the land from thence. He considered that mere good would be done by lifting the water of the river, so as to carry it over a large area of grass land unirrigated, than by constructing sewage works. The 1,000 acres now partially irrigated bear an increased annual value of 10s. an acre, and 2,000 other acres might be increased, by the use of "carriers," 30s. per acre. The dry meadow in that neighbourhood he stated to be worth 35s.; that irrigated by common water, 55s.; by the water of the Tame, with the present overflow of the tanks (which he considered better than mere river water), 65s. an acre. He knew cases in which pure spring water increased the value of land 30s. an acre. Supposing that the sewers did not empty into the river, he would be ready to pay 14s. an acre for the sewage laid on to his land, rather than be shut up to the river water; and he would rather pay this for the overflow water of the tanks than for the sewage before its entrance to the tanks. He confessed that were he in Mr. Burbidge's place he would hire the sewage, and that he would not dilute it, on account of the expense of so doing. With respect to the permanent effect of sewage, he thought it would deteriorate the grass if only applied spasmodically—say for one year, and then discontinued. Although he found the keep increased on meadows which are irrigated, he thought the hay deteriorated by reason of the destruction of the better grasses by the

water, and the dominance given to coarse inferior grasses. This he considered purely referable to the sewage matter contained on it. The meadows are irrigated in November and February, and just after the hay harvest. Upon the grazing land the water is applied about twice during the summer. In November it runs on about two days and two nights, in February about a day and a night, in summer six or seven hours. The water of the Tame he considered worth about one-third more than pure water. The comparison in hay produce between a field unirrigated, one irrigated with pure water, and another with sewage, would be as the following amounts: 25 cwt., 35 cwt., and 40 cwt. Irrigated grass improves the condition, and forces the milk of cows and sheep, but it has small fattening properties. In conclusion, he thought ninety out of every hundred farmers would eventually be glad to pay an increased rental of from 20s. to 30s. for sewage land.

Mr. I. KING, occupying a farm near Birmingham, in the Tame Valley, said that on land irrigated from the water of the Tame, polluted by the sewage of Birmingham, he experienced an increase of half a ton of hay per acre, but owing to the presence of gas refuse, he thought the finest grasses suffered. When he irrigated with pure water he also manured; now that he irrigated with the polluted water of the Tame he does not manure. His results, as to feeding grass so irrigated, are most satisfactory; milk and butter both better. He thought the Corporation of Birmingham should have extended powers, to enable them to sell the sewage to others, instead of allowing Mr. Burbidge the sole possession of it. The public interest demanded that a more general use should be made of it.

Mr. THOMAS STANBRIDGE, Town-clerk of Birmingham, said: "I have a field adjoining my house, a portion of which was manured with intercepted matter drawn direct from the sewers at Birmingham; another portion of that field (which is a new layer of seeds, and a decidedly good piece of land) was manured by my tenant, who is a butcher, with the richest butcher's dung which could be produced from his slaughter-house dung-pits, and there is as much difference between the one and the other as there is between a common and a rich meadow, the decision being in favour of the sewage matter." This, he said, was the solid manure intercepted from the outlet of the sewers, which, according to chemical analysis, was valueless. He knew Mr. Burbidge; considered his results enormous; believed his land to have doubled in value. He had applied this manure, in about the same measure as ordinary dung, for three years; it is to be had in all states, dry and very slushy; and from its appearance, as viewed through a glass, he should suppose it to contain a great deal of nitrogen.

Mr. J. T. BLACKBURN, a farmer in Kincardineshire, stated that he had used farm sewage for eight years, and had much experience in the different methods throughout the country of applying farm sewage. His experience had been with grass. The best application of sewage he had seen was at Lochend, near Edinburgh, where 2,000 tons of sewage were distributed by hose and pipe, producing enormous crops of Italian ryegrass, and raising the rent last year to £41 an acre. This was as good a return as had been obtained by the open-channel system upon any of the meadows, the amount of sewage standing at 2,000 tons, to some 6,000 or 10,000 used at Edinburgh. He thought the open-channel system a very wasteful one; did not consider the land enriched by the fluid which ran over it, merely by that which the land absorbs. The sewage of Edinburgh might undoubtedly flow over a much

larger area. Sewage should be confined to those crops which will yield the greatest return. There are many manures which will compete successfully with it as an application to grain crops, but none as applied to grass. He did not think sewage likely to be employed in general agricultural use. When he visited the Rugby water-meadows, he considered the distribution unequal, and too little attention had been paid to the grasses, the old ones grown not being at all adapted to the new circumstances. A difference in the variety of grass would lead alone to a difference of 50 per cent. in the yield. He found, to his amazement, in June (1861), at Carlisle, "a large portion of the meadows then occupied, under a warm sun, in drying hay, instead of making the most of the growing months." He considered that the surface should be as level as possible, that the grasses should be carefully selected. He advocated the pipe and hose system, and thought that two-thirds the sewage might be saved which was now used in the open carriers. The soil at Rugby is very superior to that at Edinburgh, and were the right method adopted, the difference in the results should be more perceptible than it is. Equal quantities of sewage gave very different weights at the two places. Had applied 1,200 tons through the season to grass-land—not all liquid manure, but in part an application of plain water. Had applied sewage to onion and carrot crops, letting the water run down the drills from the hose; but the system of arable irrigation is fraught with difficulty. He spoke confidently of the value of pure water irrigation. The produce in milk and butter he thought much increased by the use of sewage. In reference to a remark on the exhausting character of Italian ryegrass, he replied, "that is the very thing the farmer wants." He wants to cultivate plants that will reproduce the fertilising matter committed to the soil, in the shape of vegetable food, in the shortest time. Sewage, properly applied, running over the surface three-quarters of an inch thick, will not destroy fine grasses.

Mr. J. FENTON, engineer of the Local Board of Health at Croydon, said when he first undertook the works, in 1857 the sewage of the 30,000 people without filtration was employed over fifteen acres of land, to the disgust of the community; now, the filtered sewage from about 18,000 of the population irrigates 240 acres. The farm is so arranged that the sewage can be turned (the open channel system being adopted) to any required plot; and before it is let off to the river it is always conducted over a second plot. "The land irrigated at one time varies from twenty to fifty acres," a larger area being required to purify the water in wet than in dry weather. "I have known during the last summer that ten acres of land would take the whole sewage water of Croydon amounting to 800,000 gallons a day of twenty-four hours, without being perceived at all in the second field." Before this irrigation, the land was let at only one guinea an acre. In the year 1860, the produce of the grass land was sold by auction for £5 10s. per acre, the red clover (two crops in the summer) for £7 15s. per acre, the ryegrass (two crops) for £5 15s. The whole of these 300 acres is now let for £5 per acre. He stated that the crops of ryegrass, now the land is properly levelled for it, was selling at £3 an acre. The land, saving the old pastures, will be all laid down for Italian ryegrass. He further said, that the application, summer and winter, has averaged 43,000 gallons per acre, from three to eight days a month. He stated that the Board steadily refused applications to take more land, their present experience convincing them that the 300 acres were quite sufficient to

carry the sewage of Croydon. He considered that the ordinary grass became in course of time sewage grass. He thought about one-third the sewage was absorbed by the land in winter, and one-half in summer. At the expiration of the present lease for eight years, he expected the land would let for £10 per acre. The main difficulty he anticipated was how to get rid of the green produce.

Mr. GEORGE KING, a surveyor and drainage engineer, of Brighton, said that he had executed irrigation works for several gentlemen, who were perfectly satisfied with the results. Mr. Beaumont, of Wimbledon Park, last summer sold his first crop of grass at 70s. an acre, for hay; his second crop at 70s., to soil dairy cows; there was a third crop worth 60s. an acre. In his opinion surface carriers were adapted to meadow land, and horse and jet to arable land. He thought it would pay a farmer to use 2,000 tons of sewage per acre at 2d. a ton, which is equal to £17, and stated, that at Lochend Farm, near Edinburgh, he had seen sufficient grown to pay that. The land at Wimbledon bore scarcely anything, but he produced a sample of the first crop of common grass, after sewage, eighteen inches in length. Mr. Thompson's meadows at Edinburgh gave forty tons the first crop, twenty-five the second, fifteen the third, twelve the fourth; in all ninety-two tons per acre per year. The first crop sold for £50 an acre, retail. The sewage cost nothing; but were pipes to be laid down, the interest on the outlay would be a mere nothing to the benefit derived in any case. He considered sewage to have great advantage over solid manure, no matter how diluted the sewage may be.

Sir JOSEPH PAXTON, M.P., stated with respect to its effects, that in warming the soil it undoubtedly stimulates the growth of plants, and that as the growth increased, the capacity for the reception of stimulant increased. He thought a judicious dose of sewage favourable to wheat; this should be given in early stages, and with care as to strength. He recommended the first use of the London Sewage on the sands of Woking and Bagshot Heath, as likely to raise its value from £5 to £100 an acre. It would be the very place in which to carry on the largest amount of growth. "I look upon the question," said he, "as I look upon a cotton mill. You have a large amount of steam-power, you have a large plant, you have a very large expense going over a given point, and if you go on, you are still going on with your expenditure. So it is with a railway; if one line of rails does, there would be only half the plant, and so much more profit. If you can get land that will filter the water through, and give double amount of growth, it will be worth so much more per acre from the application of sewage." He had had no experience of sewage from towns; his experiment had been made with much stronger sewage than what is obtained from the London sewers; and this was sometimes used neat, and sometimes diluted, according to the state of plants watered.

Mr. E. O. TRUGGLES, civil engineer, of Gateshead, stated that he had used the sewage from his own premises upon his own land, upon old grass, Italian rye-grass, chicory, carrot, turnip, and cabbage crops; the quantity 850 tons per acre per annum, 50 per cent. stronger than town sewage. His sewage was applied to four acres, one acre taking the whole of the sewage every year; no manure being applied to the other three in the intervening years. The results were highly favourable as respects grass crops, very doubtful as respects cereals, good as respects roots. For grass land the best mode of applying sewage is by open carriers, the land having a fall of something like 1 foot in 20 to 1 in 50; for cereal and root crops, it must be applied in showers, with all the apparatus of reservoir tank, pipes, &c., so that the sewage should be at constant high pressure. He thought it would pay him to purchase such sewage as his own at 2d. a ton, and to dress an acre with about 2,000 tons.

Mr. G. H. HENDERSON, bailiff of the farm attached to the Colney Hatch Lunatic Asylum, in the course of his examination, stated that the sewage from the establishment was used on about 35 acres of pasture land, as well as to 35 of rye-grass, mangold, cabbage, and clover, being forced by steam through cast-iron pipes, laid 18 inches under ground. One man will apply 250 tons with hose in the day of 10 hours. This is a dressing for half an acre. The effects on the rye-grass are very great; it is cut four times a year, and the cows thrive on it. Of the sewage from about 2,150 inmates, at the rate of 500 tons a day, one-half has been applied the year

round to the 72 acres, for the last 8 years; the other half runs to waste. The pipe system being not capacious enough to pass more sewage, recourse was necessarily had to the farm-yard dung, a large portion of which also went to produce the crops, so that it was difficult to say how much was due to sewage and how much to dung. Besides, a proportion of 60 gallons of water being assigned to each inmate, the sewage was weak. The common grass mown for stock yields about 2 tons an acre; "neighbours on undressed land had got 25 cwts." The drains run very freely during the application of the sewage, and the water is not at all discoloured as it flows from the drain.

Mr. S. CRISTY MILLAR, proprietor of the Craigintinny Meadows, near Edinburgh, said that he had 200 acres irrigated by gravitation, and 50 acres by pump. The flow of sewage goes on day and night, summer and winter, the year through; but more sewage is applied in the summer than in the winter, and during the latter period, or during floods, it is allowed often to run to waste. Each field receives it about twelve times a year, generally between the various mowings, the first of which commences about the end of March. The grass is cut four times a year. The produce has at times realised £40, but this is an excessive price; the rent averages £22. The 50 acres over which sewage is pumped by steam-power are in permanent grass, and as such, owing to their obtaining less water, appear to be inferior to the land over which the sewage gravitates. The best meadows get 9,000 gallons per acre at each watering. The grass, a mixture of permanent and artificial sorts, grows best in warm weather; the rate of growth, quite magical, in 24 hours after the water is let over the newly-cut grass. Laying down the 50 acres for irrigation cost £3,000. The rent before the land was thus treated averaged £5 an acre; it is now worth £15 (there was some doubt as to whether the £15 applied to rent or produce); so that as far as this portion of the meadows is concerned, the investment "has not been profitable." A portion in consequence has been ploughed up, but no sewage is applied. Mr. Millar stated his conviction that the meadows had attained the maximum of production, and were certainly on the decline. He also said, though his land, rented at £5 an acre, had failed to benefit in a proportionate degree from the £60 expended upon it per acre, yet that land in England like that said of the Essex coast would yield a very large return for the same expenditure, and, indeed, remain worthless without it. The inclination of the land at Craigintinny is something more than 1 foot in 100, and these meadows receive the sewage water of about 80,000 persons, or of 300 to each acre.

Mr. JAMES HOPE, a farmer near Edinburgh, confirmed the last witness in his report of the capabilities of the Craigintinny meadows, and further stated that some portion of the land now rented at £30 an acre was, a few years since, worth only 5s.

Mr. J. C. MORTON, who, within three weeks of his examination, had visited the Craigintinny, the Lochend, and the Grange meadows, the works at Port Dundas, Ayr, Carlisle, Rugby, and Croydon, said he had seen a first cut of soft succulent grass from the first-named meadows weighing 10 tons. He had observed that the application of 1,200 tons of sewage spread a skin of water over the surface, and that about 10,000 tons were annually applied, valued at 1d. per ton. The Lochend meadows, he said, consist of 30 acres of old grass and 10 acres cultivated, and receive about four times the sewage supplied to the Craigintinny meadows, surface irrigation being adopted. This quantity, however, he thought could be applied to fields of the same size at lower levels with almost equal effects, if not to a larger area. A portion of these meadows being clayey and badly drained, produce less than those portions which are more pervious and better drained. The 10 acres "are watered by subterranean piping and hose, the stream of sewage working the pumps which force the water through the pipes, a water-wheel 15 feet in diameter being used to drive four pumps." The power is therefore costless, and each application per acre consists of about 800 tons. The produce is less than on land irrigated by open ducts. He said that the 110 acres of meadow-land at Carlisle is watered by the sewage of some 20,000 people. The quantity applied by surface drains is about 4,000 tons per annum. The produce is less than that yielded by the Edinburgh meadows, partly because there is less sewage, and partly because the sewage is

injured in the process of deodorisation. At Rugby, he spoke of seeing the most splendid crop of Italian rye grass; but the common grass produced results far inferior to the Craigintinny meadows, a circumstance due to the comparatively small quantity of sewage applied, and the inferiority of that sewage. Of Croydon, where the sewage is filtered, and the solid manure sold separately, Mr. Morton remarked that though Edinburgh is eight degrees to the north of it, the produce is quite as early there, and this circumstance he referred to the want of quality in the manure. He objected altogether to the use of sewage on arable land, as interfering with tillage operations. Subterranean drains, the only mode admissible, would tend to make the land wet, and "wet land can never be worked without injury." He considered that the soil would not absorb one inch of moisture per day, but that it is not necessary for the sewage to pass through, since the plant was much benefited by the brisk passage of the water over the surface. He contended for an intermittent application of sewage, since dry periods were as necessary to the plant as wet ones. Judging by the results obtained by the Craigintinny sewage, he considered it to be worth 1d. a ton, while the cost of application and expense of management might be estimated at £1 an acre.

Mr. J. BENSON, agent to the Duke of Bedford, gave evidence as to the sewage meadows at Tavistock, which lie below the town, and are supplied by gravitation. The sewage of some 6,000 people is mixed with the rainfall on about 2,000 acres, and with the water of copious springs, and voided from a culvert, flows in open drains over 95 acres of old grass land, laid out in flat plains and beds. These meadows have been let to improve certain farms; hay has been made of the whole of them—they generally produce two crops. The grass has been cut for cows, three and four times a-year, and has been valued at £10 a cutting. The land has been increased in value from 10s. to £3 an acre, some is let at £5; active competition would run it up to £7. He had no idea of the quantity of sewage applied; but considered that nothing like the most was made of it. The farther from the culvert, the slighter the effect of the sewage. The main carrier has a fall of six inches in 200 feet. "The least fall required for profitable irrigation is one foot in 100 yards."

Mr. GEORGE McCANN, who receives on 50 acres of his farm the sewage of Malvern, stated that the sewage of 4,000 persons, diluted with the rainfall of 1,000 acres, simply gravitated over the meadows. He thought it very desirable to apply it to the growing root crops, and would incur expense to obtain the proper machinery. On the land under irrigation he had cut more than 50 cwt. per acre at once. He conjectured that the whole benefit to the land, which is increased two-thirds in value, resulted from drainage and sewage. The grass is cut twice, the second crop often 25 cwt., and then grazed. Sheep, cows, and bullocks all do well on sewage grass. Always gets grass before any neighbours. The sewage he considered increased his root crops by one-fourth. Twenty-four cows and 100 sheep in a 16-acre meadow cannot eat the grass down. He had completely left off the use of guano. The value of the sewage is estimated at £70 a-year: it would be of more value if applied with pipes and hose, for then it would be possible just to keep the soil wet around the roots of plants, and the same sewage would cover a larger area.

Mr. P. W. S. MILLS gave an account of the little expe-

riiment carried on with the sewage of his own house on 12 acres of grass and two acres of ploughed land. The inmates average 30, and the sewage is applied by pipes and hose. The part of the land which is grazed carries more stock, and the part which is mown gives much more hay than it did before: vegetation is also advanced about a month. The value of the four-acre piece, which is never mown, is increased from 55s. to 110s. an acre. From the eight-acre field, ordinary grass, the first cutting of 5 tons an acre, made in April, is consumed green; the second is made into hay, generally about 2 tons an acre. After this there is abundance of feed. On the two acres of ploughed land are produced ryegrass, vetches, and roots—crops which are doubled in bulk. Seeing that the land had doubled in value, it appeared that "the sewage of 30 people was worth £30, or £1 per person." This experiment extends over ten years. The sewage requires better regulation: when most wanted there is least; when least wanted, most. Could well do with more sewage.

Mr. Wm. WATWOOD, farm bailiff to the Anerley Schools, from 1851 to 1857, stated that 12 acres of ordinary meadow and four of Italian ryegrass receives the sewage of 700 inmates. Two acres of the ryegrass was dressed by means of a force pump, the sewage being employed six times during the growing season, at the rate of 240 tons each time. Over the remaining 14 acres the sewage gravitated from the tanks. There was more than enough sewage for double the land. No difference was perceptible in the crops on the two acres irrigated with hose and jet. These two acres kept 10 cows, and therefore may be considered as giving 70 tons of green food, worth, calculating its product in milk, £120. The expenses, taking the 1,500 tons of sewage at 2d., the interest on the machinery, the labour, rent, &c., form a total of £39 8s., which leaves £80 12s. net profit, or £40 6s. per acre. The two acres irrigated on the catch-meadow system received 8,000 or 9,000 tons an acre, a great part of which flowed over the land without penetrating it, and went to waste. The 12 acres of meadow dressed in the same way, and with the same amount, gave 2½ tons of hay in place of three-quarters of a ton. The value of produce per acre is £8 15s., which would pay something under a farthing a ton for sewage. Better results could be produced with two applications, 300 tons a-time, with hose and jet, save in the case of ryegrass, where 1,500 tons might be used. The value of the land has been increased from 15s. to £5.

Mr. FRANCIS WYLEY, a medical practitioner, stated his experience with a small portion of the sewage of Coventry, which runs of its own gravity over four acres of his own and 11½ acres of corporation property, both in common grass. The four acres had been treated four years, the rest four months only. The latter was well sewage in February, and on the 21st of May yielded 17 tons of green grass per acre. The sewage has run on to waste. It is filtered before used. The 1,500 tons of solid manure thus secured per annum are sold at 2s. a ton, and pay the working expenses, i. e., £8 a-week. This manure is in great request. Of liquid manure 3,350 tons are obtained in 24 hours, a large amount of which runs to waste. Not more is required than to saturate the soil to a depth of 4 inches. So high was his appreciation of the manure, that for the prospective advantage of using what sewage he pleased from the sewer which was carried through his land for the public good, he had foregone £500 compensation from the corporation.

F. K. S.

HADLEIGH FARMERS' CLUB ASSOCIATION.

In accordance with our usual practice, we return to the doings of this Club at its dinner. Mr. W. Garden, a gentleman of considerable standing in connexion with Suffolk agriculture, occupied the chair.

Major PARKER, M.P., in replying to the toast of the "County Members," said: Although the business before the House of Commons had not of late been of so interesting a nature as that which in some sessions engaged the attention of the house, and agriculture perhaps did not receive so much attention as it should do, yet questions had arisen to show that there were members of the House of Commons who lost no opportunity of doing what they thought most conducive to the interest they represented. There were committees which

up to the present time had not borne much fruit, and amongst them a committee to inquire into the utilization of sewage, for it was very well known that in Belgium and other foreign countries the sewage of towns was turned to account. That committee had held meetings, but up to the present time nothing satisfactory had transpired. There was another subject which had furnished matter for discussion, not only in Suffolk, but in every other county—whether or not, by some judicious arrangement of the taxation, a modification of the duties on malt might not be made (loud applause). The Chancellor of the Exchequer reminded a deputation, which was addressing him, of what his duties were. He said, "My duties consist in raising the money, and where it is to come from naturally

depends upon the influence exercised upon my mind by the House of Commons." In order to bring this subject before the agriculturists of the kingdom, Mr. Booth threw some doubt upon whether or not malt was efficacious in the breeding of cattle, and it was found that six quarters of malt were equal to eight or ten quarters of any other kind of food. These were the kind of facts which bore upon the mind of the Chancellor of the Exchequer, and, as the question would shortly be brought before the House of Commons again, agriculturists would see what support they had to depend upon.

The health of "the Chairman," and also "the Vice-Chairman" (Mr. J. Rand) followed. The latter gentleman, in replying, said he thought that they might go so far as to have petitions emanating from these Societies, which, being old-established ones, would have considerable more weight than if they were signed in a corn-exchange or town-hall; and when their annual meeting took place in November, they could amend their rules as to take these subjects in.

After several comments and speeches of little general interest,

Mr. T. HAWKINS observed that there was one subject upon which he thought, generally speaking, the farmers had but one opinion, and that was the Malt-tax; and he thought that if the landlords' and tenants' interest was used in the House of Lords and Commons, the tax could stand, when all their rents were rising and corn falling. It had always been the farmer's opinion that the decrease of twopenny in the Income-tax was the cause of the Malt-tax not being repealed. If the traders of this country would not pay twopenny extra to the income-tax, they would never get a repeal of the malt-tax. He stated at the Ipswich Malt-tax Committee that it was of no use for two or three to urge this question, while the whole of the landed interest went the other way. He thought in common justice that it was rather hard for the farmer to be subjected to this impost on the most expensive crop he grew, and then be subjected to the competition of all the world. He was glad to hear that Mr. Rand looked upon this question with the eye of a farmer, and he thought the way the "disputick" was used made a great difference with regard to the amount of duty they paid. He believed steam cultivation to be the order of the day, and that it would be to the interest of every farmer to see steam cultivation adopted. There was one consideration, however—they could not cultivate small and irregular fields by steam so well as they could by horse power. Something wanted to be done in this respect, which was of more importance than offering a prize for the best lease. He agreed with the opinion stated in the *Market Lane Express*, respecting Mr. Cooper's lease, and thought that the interest of the landlord and tenant should be one; but he wished to see the subject well ventilated. There was another subject which appeared to be imperfectly understood by land agents and land valuers, and that was, what was the real value and what constituted permanent improvement to the land? What ought to constitute permanent improvement, and what ought a farmer to pay for, when he took a farm? He did not think it could be for the benefit of the landlord that a farmer should be burdened to any great excess. First of all, an incoming tenant was saddled with a great many things which were of no value to him at all. He recollected a letter being published on "Tenant Right," in which it was asked, what compensation a tenant farmer ought to receive for unexhausted improvements. Every good farmer was entitled to such compensation when he quitted his occupation. What were and what were not permanent improvements? He considered permanent improvement to land was that which would render it better for ever afterwards: such as draining, claying, and so forth. If they tile-drained a piece of land, it would be as good at the end of fifty or sixty years as it was when it was first done, and that was an improvement which a tenant ought to receive compensation for when he quitted his farm. Chalking was another improvement for which remuneration ought to be made. On his occupation at Asington he had a field a portion of which was chalked fifty years ago, and even now they could see which portion had been chalked and which had not, for on that part where the chalk had been laid the corn grew three or four inches higher. He therefore looked upon that as a permanent improvement, but he did not consider that an incoming tenant ought to be charged for manure which had been laid upon the land three or four years before. There was no doubt their leases required great revision, and the farmer ought to be put

upon a better footing, so that when he left his occupation he should receive a fair benefit for his outlay. He would give an example: In 1853, when he took a farm, he tile-drained fifty-four acres, but 1853 and 1854 being dry seasons he was not able to see the benefit, and if he had had to leave his farm then he ought to have received interest and compound interest for these three years; but supposing he had had the advantage of the tile-draining for eight or nine years, even then he should not be remunerated for his outlay. No doubt steam-cultivation would be the order of the day on all large farms, and every man would have a steam-engine, which would involve an outlay of £3 per acre, and no man after employing steam cultivation ought to leave his farm without receiving some compensation for it. The whole system of agreements between landlord and tenant wanted to be re-arranged. The farmer only asked for what was a reasonable return for the capital he employed, and he felt that Mr. Cooper's prize lease would not meet the requirements of the present day (applause).

Mr. WM. KERSEY proposed the healths of the successful candidates; the stock exhibited was some of the best ever shown, and he begged to couple with the least the names of Messrs. J. and R. Rand. This society was founded by a few farmers in the town and neighbourhood, who met from time to time, and endeavoured to establish a system whereby they might benefit themselves, as well as better the moral and social condition of the labourers. The society was also intended to improve the breeding of stock; but he thought there was one serious drawback, which was calculated to do great injury to the tenant farmers of this country. Shortly after the last show, a statement made by a member at the annual meeting was published—that he had grown an enormous weight of roots, and realized so much profit. He thought two great evils resulted from this statement: the competition for land was very much increased, so as to make it doubtful whether farmers would succeed in getting occupations for their sons, unless at such an increased rent as to make remuneration impossible (applause). He could easily imagine a landlord seeing such a statement in a paper, saying, "If a man on poor land can realise so much profit, I think for my land, which is better, he ought to pay more rent," and, in consequence, the rent was increased. In making this statement, he did not wish to injure the landowners, for they were entitled to a fair rent; but he really thought such statements were a serious injury to the society, and he hoped in future, when such statements were made, they would not be allowed to go the round of the newspapers.

Mr. HAWKINS said that unless Mr. Kersey could prove that the statement was untrue, he did not think he could do any injury to the tenant farmers, nor help the landlord to put up his rent. Mr. Robinson was a lawyer, and well calculated to drive a good bargain, and said that he sold his mangold for 15s. per ton; but he knew several who had sold theirs at 8s. per ton, and some at less. He thought that every one who read the report in the paper would see at once it was no common farmer's transaction (applause).

The VICE-CHAIRMAN having responded on behalf of the successful competitors,

Mr. ROBINSON said he had sent nothing forth to the world but what was perfectly true in all its bearings. He certainly did in November last make a statement, and he only made one mistake in that statement; instead of growing 25 tons on two acres he grew 28½ tons. With regard to the price, he stated what he made at the time, and the balance-sheet should be laid before his friend Mr. Hawkins and Mr. Kersey, who should be auditors, so that when they met at the November meeting they would be able to verify his statement. He had great respect for Mr. Kersey, but thought it was short-sighted to suppose that any landlord would take advantage of the profit a tenant might state he had made.

Mr. KERSEY said he did not mean that the statement Mr. Robinson made was not true, but he thought it was very unwise to make it. He wanted to know why farmers more than any other people should expose their business to the world. The manufacturers and traders did not, and he thought they should take a hint from them.

The remaining toasts were, "The Profession of Hadleigh," "The trade of Hadleigh," and "The Unsuccessful Competitors," &c. The evening passed off very agreeably.

SALE OF GRAIN BY WEIGHT.

SIR,—In answer to the letter from the "Practical Farmer," I consider the present movement now under discussion very important. His statistics exhibiting the ridiculous *non-uniformity* of sale of grain throughout the United Kingdom show the necessity for reform, and I do most sincerely trust that many men of similar intelligence will be added to his ranks, and that at public meetings their views and interests will be ably advocated, for the farmers and producers have important contracts involved.

The Act of Parliament requires certain returns to be made of the value of grain by the imperial quarter, to be published in the official Gazette, for the purposes of adjusting tithes and rents of much tillage land; therefore it is most important that these returns should be established on a basis as accurate as possible, in accordance with the intention of the Legislature; and that while all agree that weight is the desirable standard, it is important to preserve, as near as possible, that weight to the natural contents of the measure; otherwise confusion and injury may result, and land be subjected to unnecessarily increased taxation.

With those remarks let me now place before you the three schemes proposed, with observations.

The first is the ton, which is to be of 2,240lbs., or a decimal ton of 1,000lbs.; its proposer being willing to abandon the former, if the latter would be adopted.

The second is that the bushel is to contain 60lbs. wheat, beans, &c.; 50lbs. barley; 40lbs. oats; eight of which to constitute the imperial quarter of weight *as a standard*.

The third is that the imperial quarter shall be 500lbs. wheat, 400lbs. barley, 300lbs. oats; this latter, or third proposition, has been carried in Committee, and a General Meeting is summoned to receive the report for adoption or rejection.

At every division in committee, the ton was rejected, and the imperial quarter *by weight* as a standard was passed with majorities, the only point of difference being with its advocates what the weight should be.

The advocates of the first scheme of the ton proposed their views with great mercantile intelligence, possibly with a leaning to their own personal views; they are large importers of foreign grain, usually sell by the entire cargo, and if all could be invoiced by the ton, no doubt in that respect some slight facilities may arise. The sale price of so large a standard as a ton would greatly facilitate their system of competition. Where now often one penny per quarter loses a purchase, then one penny per ton may prevent business. The arguments advanced by these gentlemen are so far selfish that they desire to make the

change only in foreign grain, as if all other interests had no claim for consideration! and the discussion on the sale of English grain on an equitable and uniform standard is stated by them to be a subject wholly irrelevant, outside the circle of foreign importers. The standard of the ton meets with so little favour, that it is to be regretted that the progressive movement of selling grain by weight with uniformity has been retarded by the introduction of such a revolutionary idea.

On the second proposition the proposer rests its merits on the equity of the scale to all interests, its great facility of adoption, its promise of uniformity, and its great convenience to the working members of the trade and others necessarily grafted into it. The argument advanced is simply that, had Sir Robert Peel, when he changed the old and the Winchester bushel, made that a bushel of *weight*, the corn trade would have had no grievance now to complain of, the abominable irregularities of trade would never have been introduced in the various markets, and the imperial quarter of *weight* would have been the uniform standard for all purposes of the grain trade. Experience pronounces *that upon that point no doubt can exist*. If so, why not benefit by experience, and strive in a simple way to correct the error of the imperial bushel of *measure* to an imperial bushel of *weight*, on an equitable basis, and thus narrow the question, and produce that harmony of opinion necessary for success?

Foreign importers cannot complain, for at least two-thirds of their sales of imports of wheat have hitherto been made on the standard of 60lbs. per bushel. Farmers cannot complain—their interests will not be damaged. The Chancellor of the Exchequer has no grievance, his revenue is not disturbed: in introducing the measure into the House of Commons no discussion is provoked. The shipping interest can make their charter on a just basis of weight; and that important element for success, popular prejudice, will be fairly favoured.

Other branches of trade working in concert with grain importers deserve fair consideration, viz., the carriers, the granary keepers, and the porters discharging ships. The carriers and shipowners are in favour of a fair standard of imperial quarter *by weight*; the granary-keepers the same, and, above all, the lightermen and porters engaged in discharging the ships of grain: to the latter the present four-bushel sack cannot be displaced by any other equally convenient for the despatch of business; it forms the necessary weight and size for labour; its contents are such that the half-quarter of each grain forms the same bulk. The bag is filled and tied with great rapidity; and to change this simple system would cause very considerable derange-

ment. It would be well for those parties opposing scheme No. 2 to see the present four-bushel sack filled with 240lb. wheat, 200lb. barley, and 160lb. oats of average qualities, and the exhibition of such ought to convince *those willing to be convinced* that such ought greatly to facilitate a conclusion to that unanimity of action now so very desirable.

With regard to the third scheme proposed, its promoters gained their majority, the Imperial quarter of weight being favoured, and on the attractive prospect of introducing a decimal system; but although a party exists in favour of this system, but few would hazard the introduction of its *partial* adoption, which would create confusion and damage progress. If the decimal system is to be established (and I hope it may be) it can only be by a grand legislative scheme for universal adoption; all puny efforts must fail. The proposition of 500lbs. as the standard for the Imperial quarter of wheat would not be

just for chartering or adjusting the averages, which regulate certain taxes; nor would it be equitable to other branches grafted on the corn trade, who have performed certain duties for a certain price per quarter. Above all, the loss of revenue to the Chancellor, and the discussion that would be provoked to carry such changes through the House of Commons, would endorse the proposal with defeat.

No doubt "Progress," with his great ability, will reply to this, and ask what is this to do with duty on grain by weight? To that I reply, the sale of grain *by weight* with uniformity, the levying of duty *by weight*, the chartering of ships to pay freight *by weight*, forms one question, and it is desirable to adopt such a standard as will embrace the three objects in the one movement, and ensure a system of weight with uniformity.

Your obedient servant,

T. M. U.

LONDON, OR CENTRAL FARMERS' CLUB.

THE PRESENT STATE OF STEAM CULTIVATION.

The last monthly meeting of the Central Farmers' Club prior to the summer and autumnal recess took place on Monday evening, June 1, at the Club-house, Blackfriars, and was well attended.

The chair was taken by Mr. J. BRADSHAW, Knowle, Guildford.

The subject for discussion was "The Present State of Steam Cultivation," the introducer being Mr. J. C. Morton, of Stretley, Berks.

The CHAIRMAN, in opening the proceedings, impressed on the members present the importance of the subject, and expressed a hope that those gentlemen who had had practical experience of steam cultivation would, after the paper had been read, give the Club the benefit of that experience.

Mr. J. CHALMERS MORTON read the following paper: Our subject this evening has on several previous occasions occupied the attention of this Club. Eight years ago Mr. Williams, of Baydon, urged upon us the practicability of applying steam power to the tillage of the land. Four years ago Mr. Alderman Meehi made the tillage of the land by steam one of his subjects, when calling our attention to the various ways in which agriculture had availed itself, or might avail itself, of steam power; and fifteen months ago Mr. James Howard discussed the rise and progress of steam cultivation in this country. The first of these papers was, of course, a good deal of it speculative, full of estimate and prophecy, confident, as might have been expected from an able man, who had well studied his subject; and wonderfully accurate its estimates have since proved to have been, considering the small foundation of actual fact and experience which then existed on which to build. It related to the *future*. The last of these papers was, by the very definition of its subject, *historical*, describing with the most praiseworthy fairness and impartiality the successive steps by which the progress of steam culture in the interval had been achieved. It related

to the *past*. The subject this evening relates especially to the *present*; but, while that is the literal and technical wording of it on the card, yet it is plain that, as it is both the child of the Past and the parent of the Future, a discussion of the *Present* gives us the whole field over which to range. So that, although my principal object will be to lay before you the present opinions—*convictions* they may now be called—held regarding steam cultivation by the scores of men who have now had many years' experience of it; the testimony of experienced farmers to the *economy* of the field work done by steam during the spring of the present year, add testimony to the *quality* of the field work done by steam, given by crops actually growing. Although my paper will for the most part be neither historical nor suggestive, but only descriptive, yet I shall be perfectly in order if I should digress to consider both how the present state of things has been produced by patronage or discouragement in the past, and how it is likely to turn to modify the character of farm management in the future. It is on this aspect of the *present*, indeed, that the greatest interest, after all, of course must hinge. I have no doubt that the whole style and character of arable farming will be very materially altered by that general adoption of steam cultivation which is to be. And on this I claim the concurrence of all who have previously addressed this Club on the different branches of arable farming. Ask Mr. Shaw, of Northamptonshire, who many years ago spoke here of breaking up grass land, whether, if steam power had been then available for the purpose, he would not have materially altered the plans he then recommended? or Mr. Meehi, who fourteen years ago spoke here of deep cultivation by the plough, the spade, and the fork, whether he would not gladly have added the steam cultivator to his list, if it had been obtainable? or Mr. Lawrence, of Cirencester, who in 1850 addressed us on the best method of obtaining a good root crop, whether steam cultivation would not have greatly

helped him? or Mr. Baker, of Writtle, who has so often and so ably addressed this Club on the circumstances of agriculture, whether the possibility of applying steam power to cultivation, which in his time was never generally admitted, is not one of the most important of them all. Especially I would appeal to Mr. Bond, of Long Melford, Suffolk, who seven years ago read a useful paper here on the autumnal cultivation of wheat stubbles and the subsequent preparation and growth of a root-crop on stiff retentive soils—I would ask him whether steam power, if it had been at his disposal, would not have strengthened his argument, made easy and effective all his plans, and ensured their more general adoption. And I might come nearer the present time, and call for favourable testimony to steam-cultivation from Mr. Thomas in connection with the subject of rotation of crops, from Mr. Robert Smith in connection with his subject—"Stock versus Corn," and from Mr. William Spearing and Mr. Scott Burn in connection with the condition of the agricultural labourer. I might indeed come down to the very last meeting of this Club, when Mr. Spearing, of Moulford, read one of the most instructive and suggestive papers which have ever been listened to in this room, and claim his favourable vote on the ground of the influence which steam-cultivation will exert on the temperature of soils. I know a cutting in the Gloucester and Bristol Railway, between Frocester and Stonehouse, which was made through a bank of as cold a clay as was ever cultivated—lias clay, which had been undisturbed since the days when the remains of the great fish lizards of olden time were imbedded there. The stuff was wheeled along the line barrow-load by barrow-load, and tumbled down the slope, to form an embankment close by—ditch and bank being of course alternate in crossing an uneven country. This cold clay, which had lain impervious to air and rain for ages, no sooner got this "smashing up" than it heated, smoked, and actually burned. Has this fact no bearing on the theory of tillage, and on its relation to the underground climate of soils? There is a sea-side cliff of bituminous shale near Weymouth, which every now and then takes fire. It steams and smokes for a while, until the air has done all it can, and then it goes out. By-and-by a storm tears down the old effete surface soil, as it may be called, of the cliff, and exposes the previously covered subsoil, as it may be called—a new surface—to the action of the air, and the cliff takes fire again. Have these facts no bearing, do you think, on our practice as tillage farmers? There may be no iron pyrites or bitumen in our soils and subsoils, but there are substances like these, whose tendency to chemical union with the oxygen of the air equally with theirs produces heat; and that tillage agency which the most effectually lets the air in on fresh material within the soil, will the most beneficially influence the underground climate—not only by its assisting drainage to let spring showers through the land, but also by its facilitating chemical action within the land, and so producing heat.

And if I might interpose here one or two minutes' talk on the theory of tillage in relation to steam-cultivation, I would call attention to the fact that those cases of heat produced within a mass of earth by stirring it and introducing air, are, after all, of less importance for their bearing on the subject of underground climate than as proving the production of general chemical action and disturbance in this way. It is by this general chemical action and disturbance produced by the introduction of air that fresh food for plants is prepared. There is abundance of it down below the level to which horse-tillage extends, and so it must of course be conceded there is plenty of it below even the level—though that is much deeper—to

which steam-tillage extends. The main difference between the two lies not in the greater depth to which so great a power as steam can work the land, though that is a most important consideration, but in the fact that horses trampling in the furrow along which the tool they draw has gone, do harden a layer of earth above the storage which is in their case thus cut off, and thus make the access both of the air which would fertilize this mass of earth below it, and of the roots which would thus feed upon the material thus fitted for their food less practicable and easy. In steam-tillage, where the power stands off the ground, and is conveyed by a long rope to the tool—where the tool itself is carried on large wheels, this mischief, whether it be poaching the ground which is thus moved, or hardening a floor immediately below it over the earth which is not being moved, altogether disappears. And it is not too much to say that a clay soil deeply drained, and then deeply stirred and cultivated in dry weather by steam-power, is in altogether different circumstances from any which before all this it had ever experienced. There is unquestionably an immense storage of fertilising matter in it, of which little use has till then been possible, which has thus been made available for the growth of plants, and it is hardly possible to exaggerate the benefit which men of science, knowing the methods of plant growth, may confidently predict, and which indeed men of practice have already experienced as the result of steam-cultivation in such cases. Gentlemen, we hear now a-days a great deal about the exhaustion of English soil and English agriculture. Baron Liebig in his recent work praises the agriculturists of China and Japan at the expense of the Western Barbarians, who in these islands are disposed to wash their towns and houses clean. But we use the years and vigour of the longer life which we have thus won for ourselves in balancing the account of manure thus wasted by quarrying guano in Peruvian islands, and by exchanging in various ways our labour for imported fertilising matter. And, however foolish in itself the waste of sewage no doubt is, yet the country as a whole has benefited, and agriculture has not on the whole been injured by the extension of the sewerage of towns. Those, however, who have been led by Liebig to fear the rapid exhaustion of our soils in this way, know but little of the enormous storage which exists in subsoils hardly yet opened for the benefit of agriculturists. And I do not ask the chemist to teach us this. There is hardly an observant agriculturist who has not many a fact within his own knowledge and experience to prove what an enormous reserve fund and "rest" exists, into which it is his business anyhow if possible to put his hand. And I do not say this with any special regard to the interest of the tenant as against that of the landowner. Both are interested in increasing the current fertility of the land—for good management can easily maintain that when once it is obtained, and out of it comes rent as well as tenant's profit. There is a field of wheat close by the Eynsham station at this moment, of stiff clay land, in the occupation of Mr. Joseph Druce. And at intervals of about eleven yards all across the field—across its ridges, too, not coinciding therefore with any furrow or shallower soil of the present or any previous cultivation, there are stripes varying from a foot to a yard in width of lighter colour and scantier growth, across the dark green of the vigorous wheat plant which is just coming into ear. What is the cause of these lines of comparative infertility? They are where the clover seed barrow missed two years ago—that land had not been robbed at all last year, whereas the rest of it had yielded a heavy crop of clover hay—those lines had produced nothing last year, and as a consequence they produced less this year. On

the remainder, where the clover plant had come and prospered, the treasures of the subsoil had been brought up by the clover root into the surface soil; and on these, as well of course as on a similar deposit from the atmosphere, the wheat plant is feeding now, to its evident advantage, and to the evident benefit of the landlord as well as of the tenant, as proved by the poor growth of the wheat where the plant had missed. It is both to fertilise and to open up for use that storehouse to whose riches the clover root has access of its own, that is the object of steam cultivation. The poor land which is growing poor wheat in strips is not exhausted, as Liebig would assure us. It is full of food, as the clover root proves to us: and deep and thorough tillage by steam power will lay it open for us. The very finest bit of wheat I have seen this year, and therefore no doubt one of the finest bits in the country, for I have travelled about a good deal this spring, stands in the very middle of Salisbury Plain, not two miles from "The Bustard"—a large extent of perfectly uniform dark green, with stalks standing as thickly as possible, too thickly indeed I should say, were it not that they retain their vigorous growth, though on the point of coming into ear. And close by is the poor down, with a scanty growth of grass hardly yet showing any sign of spring growth, and near at hand are gorse and wilderness growing hardly anything of use. What is the cause of this extraordinary disparity of fertility? Of course it is mainly owing to the right plant being grown, to use what food for plants may be available. It arises also, I dare say, from artificial aid afforded to the wheat plant, of which the grass and gorse had not the benefit; but mainly and especially it is owing to its having been old land, as they call it, ploughed up for the first time. The old land in this case contained no doubt a large store of vegetable matter, whose rotting and destruction after tillage would yield a rich supply of various substances on which plants feed. I may quote this instance, nevertheless, as one of a multitude which prove how, whether in soil or subsoil, there is an enormous storage of food for plants, to which tillage implements properly applied will introduce us; far below our cultivated fields, as well as on the surface of fields in grass, there is plenty of *old land*—land yet unmoved by the cultivator, which, when once it has been drained and broken up and subjected to the fertilising action of the weather, will yield stores of fertility as marvellous as that tract of poor land, now in promising wheat, is now exhibiting in the middle of Salisbury Plain.

Gentlemen, it may be thought that in these stories of embankments heating and of cliffs on fire, of clover failures with their consequences, and of down land tillage, I am collecting illustrations which have but slight connection with our subject. I do not think so. Every illustration which can be quoted in proof of the stores of latent fertility present in our soils and subsoils tells in favour of what is the most perfect system of tillage yet known to agriculture—in favour of what is ultimately to be the key by which these stores are to be made accessible. I began by claiming the concurrence of all previous speakers on arable farming in this room, in the influence which steam cultivation is to exert on agriculture: I shall now endeavour to bring forward such evidence of its superiority, economy, and efficiency, as will convince everybody else. I may as well at once announce that I do not mean to marshal my facts as a philosopher would do, watching for the lesson to which they may lead, with no prepossession in his mind to affect his judgment. I have long since come to a conclusion on the subject, and knew well what the lesson must be, long before in this instance I got my teachers together. And when Mr. Carbet proposed to me to undertake the introduction of this subject to this Club, and con-

sulted with me as to the monthly meeting to which it might be best committed, I chose the last of the meetings before summer, knowing I should thereby have all the spring experience of a hundred farms or more to lay before the meeting, and that (convincing as it must be both of the efficiency and economy of steam-cultivation), its publication now would be in time to enable those whom it must convince to give their orders for steam-ploughs and cultivators, and obtain them in time for autumn cultivation. The logical, and as it seems to me unavoidable conclusion of the evidence I have collected is, that every arable farmer who can spare six or eight horses, and yet have a remainder enough for all the carriage work of his farm, may profitably adopt steam-cultivation. That is the advice which I shall confidently give, and I believe its soundness is fairly borne out by the many cases whose details have been already published. It is the business of this paper to lay these details before you. I do not however say that I shall merely lay the evidence before you which has been collected, because it seems to me to be also the duty of the introducer of such a subject to state the impression it has made upon himself. The evidence by which the impression has been made will, however, accompany it, and correct it if necessary. I have during the past two years walked over at least fifty steam-cultivated farms in the southern counties, obtaining on them full details of the cost and fruits of steam-culture from their tenants. During the same time, especially within the last few months, I have had returns sent to me from upwards of 100 steam-cultivated farms on the same subject, and having had frequent opportunities both of seeing steam-ploughs and cultivators at work, and of seeing the results of previous steam-cultivation, I certainly have a right to an independent opinion on the subject, and it does not seem to me that there is any impropriety in my stating it. There are plenty of examples of success to be quoted of Smith's cultivator, Howard's cultivator, and Fowler's plough and cultivator. I believe there are no examples of entire and disheartened failure, unless it be one or two of the original ploughs and tackle sent out by Mr. Fowler. Cultivation or grubbing—such work as four and six horses would do less perfectly at the rate of about three acres a day—is better, cheaper, and more effectually done, in lots of cases, by steam power for 3s. to 4s. 6d. an acre, in the actual outgoings of labour, coal, oil, and immediate repairs. Cheaper work of this kind has been done by Fowler, and, taking the last year and the present, is being generally done by Fowler, than by either Howard or Smith. I state this, not as an opinion, but as a matter of fact, which I have verified in many instances. On the other hand, there is a larger proportion of instances when an unfortunate experience has followed the adoption of Fowler's apparatus than in the case of either Smith's or Howard's tackle. And of course it is by a comparison of successes and misfortunes that one learns both the possibilities and the risks of the different methods in operation, much better than he can from the decision of judges at agricultural shows, who in a few hours, amidst the confusion of thronging spectators, have to make up their minds. Taking the decisions of the English Agricultural Society for example, I believe more good has been done by the opportunities given for the public working of steam implements, leaving spectators to form their own opinion, than by the awards of the Society's judges. It is well-known that those awards have been consistently throughout in favour of one particular form of steam-cultivating apparatus. I do not believe that, in the upshot of it, that constant verdict has misled the public. The public interest has in the long run and at length been served by the encouragement which has been thus given to that system of

applying steam-power to the cultivation of the soil. But I cannot doubt that in particular instances that verdict has been wrong. The great Chester award, for example, for the best method of applying steam-power to the cultivation of the land, has, in my opinion, been shown by events to have been a mistake. The prize tackle on that occasion is, I believe, nowhere now; no one uses it, no one makes it, while the tackle which competed with it is still being turned out weekly from the manufactory, and is in lots of instances (in larger numbers than of any other kind of steam-cultivator in the country) profitably at work. It may illustrate both the particular wrong and the general good thus done if I mention the facts of two sets of tackle bought at Chester. The prize set was, I believe, bought by Mr. Redman, of Overton, near Swindon, and did good work in that year, but at great expense for repairs, and great difficulty and labour in getting so cumbersome an apparatus about. It was exchanged for an improved set in 1860; and in 1862 it was still further improved by the adoption of the clip drum and slack gear apparatus. This original tool was made by the Stephensons, and consisted, with travelling anchor on the opposite headland, of engine and windlass, travelling separately, but fastened together when at work. Smith's tackle, shown by Howard, at Chester, was sold to Mr. Pullen, of Sutton Courtney. It, on the other hand, has been worked ever since unaltered, and requiring but little repair. It has grubbed about 600 acres a-year ever since; it has displaced about 12 horses per annum, and thus saved £400 a-year by an expenditure of about £200 a-year ever since. I cannot doubt that the appeal by Messrs. Smith and Howard to experience for a reversal of the finding of the Court below has been here allowed, and that the four years' experience of the two competing sets of steam cultivating apparatus has upset the few hours' trial before the Society's judges. But now comes another aspect of the affair. Mr. Fowler, who latterly perhaps has had no reason to complain of the Society's awards, but who had already earned his prize at Chelmsford, if he earned it anywhere, has been making great improvements in his machinery. Confident, and rightly confident, as events have proved him to be, that the direct draught of the tillage implement is the best—confident that to take the rope all round the field which is being worked, drawing the tillage tool to and fro along one side of the quadrangle thus formed, and winding up the rope upon a windlass as the unfinished piece thus surrounded diminished in size—confident that all this involved the tear and wear of more rope, as well as a consequent greater waste of power—confident, in short, that he was essentially right in his original plans—he has so improved and simplified his machinery that while, in travelling engine and travelling anchor and immediate pull to and fro of the tool between the two, it is the same tackle as before, yet practically it is now an altogether different set, very greatly superior to its prototype at Chester, wasting less power, using less rope, employing less manual labour than its rival there. So that when it came the other day, at my request and at Mr. Fowler's expense, to Sutton Courtney for comparison, as I had hoped, with other rival systems there—for examination by itself, and on its own merits only as it proved—its performance during eight or ten days' work was sufficient to convince Mr. Pullen himself of its superiority to the plan to which he had been accustomed. And wherever, as on Mr. Pullen's farm, there is a large extent of open land where a three or four hundred yard furrow can be had as a general rule, I do not see how it is possible to avoid the conclusion to which Mr. Pullen himself then came. The engine of 12 or 14 horse-power travels along one headland in charge of the engineer, being attended by a boy and horse and cart bringing water and coal.

The anchor, 400 yards off, in charge of a lad, travels along the other headland, and the rope passes round the clip drum below the engine, which lays hold of it, and grips it, and pulls it with itself, though having only a single half turn hold of it. It passes to the other end of the field, taken over five or six rope porters, which carry it unattended from one side of the field to the other—it passes round the drum below the anchor, and at either end is tied to the plough frame, being coiled up there on two pulleys, or drums, which gear into one another, so that one-fifth of the power exerted in drawing the tool is also available for tightening the rope all round between the anchor and the drum, thus ensuring that the rope is carried on the porters, and does not drag upon the ground; ensuring, too, that the rope is held tightly in the clip drum, and does not slip; ensuring that, when the furrow shortens, the rope winds up of itself, and when it lengthens, winds out of itself. Add to this the ploughman, and the tillage implements, and two boys to shift those porters which carry the rope in front and behind the plough, and you have a perfectly simple and efficient set of apparatus. I shall make a reference before I conclude to the results of experiments which have been during the last fortnight made at Sutton Courtney on the draught of Fowler's apparatus, and of Smith's and Howard's tools, by Mr. Harrison, M. Inst. C. E., late Manager of the Gloucestershire Steam-plough Company, and myself. They are incomplete: I had hoped to have had a set of apparatus from Bedford, with which to compare the set from Leeds. If, however, Mr. Howard is able to let Harrison and myself put one of his sets through its paces with the dynamometer to-morrow at Bedford, it will yet be possible to publish in the report of this meeting, with the results obtained from Fowler's tackle, the corresponding results obtainable from his own—though it would, of course, have been more satisfactory to have obtained them both upon the same land—and I hope that that may yet be done at the Exeter meeting. I shall not, however, speak of these experiments here in any detail. They, like all questions involving many figures, will be better understood by the eye than by the ear. The readers of the agricultural papers, and of the Club reports, will have an opportunity of learning the results. I will, therefore, leave the subject of public trials and society awards, and come to agricultural experience. And let me say I have quite as much satisfaction in announcing the success of Messrs. Smith and Howard in the field as I have in relating that of Mr. Fowler. It is the advance of steam cultivation in which I am interested, not the success of one or other of the rival manufacturers. So true is this, that I was annoyed on receiving returns to the last set of inquiries on the subject which I issued, to find that I had omitted to ask whose tackle my correspondents employed. This, however, I have other means of verifying, and I will refer therefore to one or two of the results which have been obtained by

(A) Mr. Smith's apparatus.

1. Messrs. Druce, of Eynsham, farm about 900 acres of arable land and 800 of pasture. They used to work 27 horses and 22 oxen; they now work the same land with 19 horses—8 horses and 22 oxen have been put down since the purchase of Smith's tackle three years ago. They get over about 700 acres of grubbing on the two farms each year. This spring, on the lighter farm of the two, Mr. Samuel Druce has got about seventy acres worked one way, and has crossed the same seventy acres six and seven inches deep in twenty days, including removals, fire in number. Coals, 8 to 10 cwt. a-day; oil, 1s. 6d.; wages, 15s. 2d.; water, nothing, being provided in every case by wells close by. The whole cost of wages and fuel is 28s. 6d. a-day. The 140 acres done in twenty days

were at the average rate of seven acres a-day, or about 3s. 6d. an acre.

2. Mr. Teward, on the Prince Consort's farm at Osborne, has grubbed 94 acres one way, and crossed 80 of them, 8 to 9 inches deep, in 32 days, viz.: 174 acres at the rate of 5½ acres a day upon an average, at a cost of £3 15s. for coals, £1 15s. 9d. for oil, £25 1s. 4d. for wages, £3 8s. 6d. for repairs—£89 in all, or 4s. 6d. an acre on the average.

3.—Mr. F. Sowerby, of Aylesby, Grimsby, who has had Smith's tackle since Sept. 1, 1859, had grubbed 1,300 acres with one rope, and is now using his second rope, which had done 1,000 acres up to last winter, and has done 300 acres this spring. Last year he grubbed 1,075 acres 6 to 8 inches deep in 116 days, having paid £178 for wages, coals, and oil, and £10 a year for expenses since the beginning of his experience. This £188 amounts to close on 3s. 6d. an acre over the whole. This spring 300 acres, that is 150 acres grubbed one way and crossed, have been done in 33 days, at a cost of £12 17s. 6d. for coals, and £1 10s. for oil, £25 5s. for wages, and £2 for repairs—£50 in all, or about 3s. 4d. an acre. Gentlemen, I have lots of other examples, and you will read a fuller statement in the papers where my statement is published—these, however, are all cases where the tool is regularly at work, and has been so for years, while the details of good steady management have been habitually recorded, and I say that as to the expense of steam cultivation in these cases there is no doubt whatever that is very much less than that of horses.

Take now an example or two of Howard's tackle. It acts, as we all know, on the same principle as Smith's, and consists of stationary engine and windlass, with ropes conveyed round from sides of the field and drawing a cultivator to and fro along one of the sides.

(B) *Mr. Howard's Apparatus.*—(1) Mr. Taylor, manager of Baron Rothchild's home farm, at Mantmore, has ploughed 75 acres, grubbed 110 acres, and grubbed a second and third time as much as 160 acres, and worked 110 acres with heavy drags—in all done 455 acres of work in 78 days, at an average rate of about 6 acres a day, with eight removals, generally effected without the help of a horse, at a cost of £23 12s. 6d. for coals, £2 10s. 6d. for oil, £81 14s. 4d. for wages, and under £10 for repairs—about £118 altogether, averaging about 5s. an acre for the whole operation (ploughing, grubbing, and harrowing). It is a heavy clay soil.

(2.) Mr. Pike, of Stevington, Bedford, also on a heavy soil, has grubbed 157 acres once, and 107 a second time—264 acres altogether—five to eight inches deep, in 42 days, or about six acres a day, spending about £26 in coals, £1 14s. in oil, £30 in wages, and very little on repairs—£57 in all, or very little more than 4s. an acre.

(3.) Mr. Bray, of Pyrgo Farm, Romford, has grubbed 72 acres, and crossed them, about nine inches deep, in twenty days. He has done it at a cost of £3 4s. 8d. in coal, £1 in oil, 10s. in repairs, and £20 10s. in wages, including all horse labour; or £30 in all, being at the rate of about 4s. 3d. an acre.

Of course these are not the worst examples. They are good examples both of the experience of customers and clients of Mr. Smith and of Mr. Howard. But you will see the whole of them in the published statement.

(C.) *Mr. Fowler's apparatus* is more costly than either Smith's or Howard's. A larger capital is invested; and it ought therefore, according to a very general rule, accomplish more and cheaper work than its rivals. So costly is it, they say, that it is not preferred by tenant-farmers. It is nevertheless the case that, of the 46 instances of purchasers known to me, thirteen are landowners, or for landowners, three are for letting out, and thirty are for strictly tenant farmers.

(1.) Mr. S. Plummer, of Peasemore, who holds 750 acres of very stiff soil on the chalk near Newbury, bought Fowler's engine and tackle in 1860, costing £780. He has bought 800, 500, 500, 200, and 500 yards of rope in all, at and since that date. The whole cost of repairs, including all the alterations, and the rope since purchased, has amounted to £320. He had ploughed 675 acres and grubbed 2,078 acres, up to the end of 1862. The depth of the work varied from six to nine inches. The tilth of the soil could not be better; and the produce is much im-

proved. The whole of the tackle is now in good order, and the rope will last another year. Taking last year by itself, 310 acres were ploughed, and 615 grubbed 6 to 9 inches deep, in 118 days, averaging nearly eight acres a day, at a cost of £87 in wages, £61 in coal, £6 in oil, and £98, including purchase of rope and repairs—£250 altogether, or 6s. per acre, one-third of which is ploughing; and, remember, this includes the cost of rope, which the other returns did not do. This spring, he has ploughed 70 acres and grubbed 270 acres, and crossed with the grubber 125 acres, in 65 days; being at the rate of five acres a day for ploughing, and about eight acres a day grubbing; the wages paid being £18 16s., the coals £34, the oil £3 4s., and the repairs £1 10s.—about £87 in all, or less than 4s. an acre all round; or, if 6s. per acre be charged for the ploughing, about 3s. an acre for the grubbing.

(2.) Mr. Frampton, of Benson, near Wallingford, has ploughed 196 acres and grubbed 119 acres in 51 days, at a cost of £42 for coals, £2 11s. for oil, £25 6s. 5d. for wages, and hardly any repairs—£70 in all, 4s. 6d. all round, or if 6s. is charged for ploughing, about 2s. 6d. for the grubbing.

(3.) Mr. Giles Edmonds, of East Leach, near Lechdale, who farms 2,050 acres of arable land, both stiff soil and light brashy soil, chiefly the latter, as well as 425 acres of pasture, has had Fowler's tackle since August last year. He occupied 56 days, and spent £42 in coals, £2 16s. in oil, £45 in wages, and £20 in repairs, in ploughing 270 acres, and grubbing 240 acres, averaging in all 9 acres, and £3 a day, or about 4s. 6d. an acre, more than half being ploughing. This spring he has ploughed 15 acres, grubbed one way 456 acres, and cross-grubbed 257 acres in 48 days, at a cost of £36 in coal, £3 12s. in oil, £31 for wages, besides £10 for water-cart, and £15 to £20 in repairs—being £100 in all for grubbing 718 acres once over and ploughing 15, or 2s. 9d. an acre all round. I wrote to Mr. Edmonds, saying, "Of course the 31 removals of which you speak as having taken place during this work are not included in the 48 days you put down to work?" This is his reply:—"The time lost by the 31 removals is included in the time named, namely 48 days. You may easily suppose so when I tell you that our day's work on several of them with the scarifier was from 20 to 25 acres a day: the removals brought back the average of the work to the 15 acres a day. Of course wet half-days, of which we had two or three, I did not include. Twenty acres and more to another ground the same day, possibly from a quarter to half a mile distant, we have done more than once.—GILES EDMONDS." Gentlemen, here you have a case where the land is all laid out in long fields 300 to 400 yards wide, where the land though in places clayey is generally a light stone brash upon rock. The work done by steam-power is in this case hitherto unparalleled, but it is on a sufficiently large scale, and altogether on a farm and from a farmer of such unquestionable standing, that I look upon this example, striking as it is, as one of very great authority. One more example and I have done.

(4.) Mr. Arnot, of Carshalton, member of this Club, has ploughed 96 acres, and grubbed 196 acres, upwards of 6 inches deep, in 35 days; about £18 has been paid for coals, £1 13s. for oil, £23 12s. 6d. for wages, and nothing but a few dozen points and shares for repairs—in all about £44 for close on 300 acres, one-third being ploughing, averaging nearly 9 acres a day, and close on 3s. an acre. As I said before, there are good samples of the work completed, and of the cheapness with which it is done. The character of the soil affects the result, and the best examples of Fowler's and of Smith's tackle I have quoted are from lighter soils than those which have been quoted of Howards. Take from a heavier soil 152 acres, being a "very heavy clay," and 46 acres a lighter soil, the following example of Fowler's tackle, being on the farm of Mr. E. Roberts, of Berdon Hall, Bishop Stortford: 141 acres have been ploughed, and 57 acres have been grubbed after ploughing, 6 to 9 inches deep in 41 days, at a cost of £22 10s. for coal, £1 17s. 6d. for oil, £21 3s. 8d. for wages, and £5 for repairs, or about £50 altogether. Here the cost is 5s. an acre all round. Take the farm of Mr. Grosvenor Hodgkinson, M.P., near Newark, of "moderately stiff clay," where 127 acres have been ploughed, 178 acres have been grubbed, and 39 acres cross-grubbed in 48 days, at a cost of £27 10s. for coal, £2 15s. for oil, £34 12s. for wages including water, and £24 8s. for repairs—about £95 altogether, or 5s. 6d. an acre all round.

Take the case of Mr. Richardson, of Hibaldstow, who uses Fowler's smaller engine and tackle. He has on various soils, chiefly for hire, grubbed 650 acres one way, and 260 across it—900 acres in all in 82 days this spring, costing, so he tells us, 6d. per acre for coals, 2d. per acre for oil, 1s. 6d. an acre for wages, or about 2s. 2d. in all. And I know of many good examples of unquestionable success which are not reported on my list. There cannot be a doubt that steam-cultivation may now be declared by the Central Farmers' Club to be an unquestionable success, so far as mere economy of work is concerned.

Of course the immediate outgoings—coals, oil, wages and repairs—are not all the expense. The rope wears out; it costs on an average 1s. an acre, in addition to which I have said the engine and tackle wear out. If we charge 10 per cent. upon them to keep them good, that will amount to from £50 to £80 a-year, equal to 1s. 6d. or less per acre upon an ordinary annual performance. The capital invested in its purchase cannot be procured under, say 5 per cent., equal to another 9d. or less. Altogether the charges come to from 5s. to 6s. for grubbing, and from 8s. to 9s. for ploughing per acre. These include the utmost amounts for tear and wear and capital, and certainly they are below the cost of horse-work. Farmers will pay from 8s. to 12s., and even 20s. per acre, and supply coal and water, to those who will let the steam tackle out for ploughing and grubbing land, and thus show their estimate of the worth and quality of the work. Of course as to the quality of the work I have less definite testimony. It is plain on the face of it that no definite valuation on this subject is possible, and yet it is here that the great superiority of steam-cultivation exists. I can quote Mr. Plummer, of Pease-more; Mr. Newton, of Campfield, near Woodstock; Mr. Redman, of Overton; the Rev. Mr. Huxtable, of Blandford; Mr. Pocock, of Bourton; Mr. Ruck, of Criklade; Mr. Taylor, of Mentmore, and many other authorities on the subject. It is the superior quality of the work that makes all the difference on heavy soils. The difference between ploughing in good condition and when wet is not to be measured by money on clay lands. It is all the difference between failure and success. So that while it is on light soils, and where great speed can be obtained, that the greatest and most wonderful results as to superior economy are attained, yet it is not there—it is on the stiffest soils that the greatest advantages are realized. The power of dealing rapidly and wholesale with your tillage-work in autumn on the clays is the great advantage which the steam-ploughman possesses. And I do not in these remarks claim more for one system than another. The ability to stir up the land to a greater depth than can be done by horses, with hardly any pressure on the soil or subsoil, is common to them all. I fear my story is getting too long and wearisome to retain your attention much longer, and I have not much more to say.

It is impossible to state intelligibly in a quarter of an hour the results of the experiments on draught made at Sutton Courtney by Mr. Harrison and myself: I will only say what must indeed be plain to any one beforehand, that there is very little waste of power indeed in the direct system of traction. It took only three-quarters of a cwt. to pull the rope round with the anchor and engine 350 yards apart when tightened up with a 6 cwt. strain upon it, so as to be wholly carried. Another cwt. was required to make the anchor go. It took from 3 cwt. to 3½ cwt. when badly carried, and it took 5 cwt. when wholly dragged. These figures show the advantage of the slack gear, which always keeps the rope with a strain of 1-5th the draught, viz., from 5 to 6 cwt., according to the work being done. As to the draught when at plough, it was, as nearly as possible, four times the corresponding work of Howard's horse plough worked by a team at various depths beside it. In the case of Smith's tackle, worked as Mr. Pullen usually works it, we found that when going ½ to 6 inches deep it took a draught beginning at 11 cwt. and ending at 10, as it got near the end of the furrow, nearer therefore to the engine. And the dynamometer placed in the rope on the side of the quad-

range next the engine, between it and the grabber, began at 15 cwt., and as it got close to the windlass ended at 14 cwt. There were thus 4 cwt. of work more done by the engine than was taken by the plough, and that 4 cwt. were lost in the dragging of the rope and turning round the snatch-block. I mention this to show how much loss of power takes place when the rope is badly carried. When not carried at all, Fowler's rope takes 5 cwt. to drag it, when not dragged at all it takes only ½ of a cwt. in a furrow 350 yards in length. Here, in working Smith's grabber, 4 cwt. were lost in a length of rope between the grabber and the engine of about 500 yards, laid round three sides of a quadrangle. In drawing out the rope, to lay it round at starting, it took from 0 to 1½ cwt. in drawing it 110 yards to the first snatchblock; it took 1 to 2½ cwt. from the first to the second snatch, about another 180 yards; and it took 2 to 3 cwt. in going from the second to the third snatchblocks. At the time it was taking 3 cwt. of draught with the brake as usual, it took 4 cwt. with the brake held so hard as to keep the rope well off the ground between the porters; and it took 3½ cwt. with no brake at all in use. It is, I think you will agree with me, impossible to state these figures at any length, so as to enable you to realise the state of the case from mere hearsay. I must leave a full comparison of them until the figures are in type, when you will understand their bearing on the affair. It is right to mention, however, that I understand that in Howard's new tackle the break and draught windlass are made to gear into one another, so that the drag upon the rope as it leaves the drum is not dead weight wholly lost. The full account of these comparative trials will however appear, and be I hope intelligible, in the published report. Meanwhile, it is worth remembering that, after all, the agricultural value of the tool is determined in the ordinary farm use of it from week to week in the field, and there these tools stand on more even terms than dynamometrical experiments would indicate. If, as I believe, Fowler's plough and cultivator do more work per unit of power and per unit of cost than any other, yet for their adoption satisfactorily very large alterations are needed in the condition of our fields as they ordinarily exist. It was on this account, I have no doubt, that Mr. Savidge, of Saraden, said, as I heard him last Wednesday: "Some think steam ploughing will one day be general. In my opinion it will never be general." This was the utterance of a man educated by his experience of Fowler's tackle, but moreover forgetful of the immense improvements and alterations which are every day making in the arrangement of our fields. Gentlemen, I fear I have wearied you with my long story, yet the half remains untold yet. In order to state the present position of steam culture I ought to have described the double engine system as adopted by Fowler, and with very ingenious arrangements for coiling and uncoiling the rope, which must reduce the tear and wear of rope to a minimum, as also adopted by Mr. Savory, of Gloucester. Mr. Coleman's plans with two grubbing tools, one engine, and light single anchor, bearing the strain only of dragging back the empty tool, ought to have been referred to. Mr. Smith's (of Woolston) combined drilling machine and grabber ought also to have been described. I consider it a most valuable implement, which it has indeed been proved to be by the crops now growing sown by it. The question of grubbing *cereus* ploughing ought to have been discussed, and the differences of opinion on the subject referred back to their origin in differences in quality and condition of the soil. All this must be left unsaid—and much too that might have been added, on the influence of steam cultivation on the condition of the labourer. One word may be added, however, on this point. Country lads and young men ought to be educated up to an ability to manage all farm tools; and steam cultivators, which will one day be general, should be as familiar as any of them. And as the latest novelty in the present condition of the steam plough question with which to conclude, I will refer to the argument which I heard last Wednesday powerfully urged by Mr. Savidge, of Saraden, before the Oxford Farmers' Club—that in all large national and parish schools a small steam engine ought to hold a permanent place among the educational apparatus, and all boys ought to be taught, before they leave the school, so much of its construction and management as to enable them with the less difficulty to take the place of engineer, which will soon be open on many a farm where at present no agricultural labourer exists able to undertake it.

SMITH'S APPARATUS.

[THE FOLLOWING ARE THE RETURNS OF WORK DONE THIS SPRING, UP TO MAY 16, REFERRED TO IN MR. MORTON'S PAPER BEFORE THE LONDON FARMERS' CLUB.]

No.	Soil.	Acres grubbed.		Depth of work.	Days at work.	No. of Removals.	Price of coals per ton.	Cost of				Address.
		1st time.	2nd time.					Coal.	Oil.	Wages.	Expens.	
1	Various	94	80	Inches 8 to 9	33	11	£ 1 0 0	£ 8 15 0	£ 1 16 9	25 1 4	d. 8 8 6	A. Toward, Osborne, Isle of Wight.
2	Mixed clay	83½	—	4	13	7	0 17 6	4 16 3	0 8 6	13 6 6	0 16 7	W. Smith, Woolston. * Grubbed and drilled.
3	Loam and clay	160	180	8	33	7	0 16 0	12 17 6	1 10 0	35 5 8	2 0 0	F. Sowerby, Aylesbury.
4	Various	70	70	7 to 11	20	5	0 14 0	6 10 0	1 12 6	15 4 4	0 10 0	S. Druce, Eynsham.
5	Light	160	180	9	64	—	0 5 0	6 8 0	1 13 0	51 4 0	1 10 0	C. Weston, Teddesley Park.
6	Strong on chalk	17	34	4 to 7	6½	0	0 16 0	1 16 0	0 4 0	4 0 8	0 1 6	J. B. Dring, Spilay.
7	Clay	59	59	9	32	8	1 0 0	16 0 0	0 10 0	19 4 0	1 4 0	J. S. Crawley, Luton.
8	Heavy	114	66	5 to 8	36	7	0 18 0	16 4 0	2 0 0	27 18 0	3 18 0	T. Inskeep, St. Ives.
9	Various	145	90*	8 to 9	40	13	1 0 0	20 6 0	2 10 0	29 10 0	1 10 0	A. Fletcher, Salisbury.
* Also 91 acres of ploughing, 5 inches deep, with Fowler's plough.												
10	Rather strong	55	55	5	13½	4	1 7 0	6 0 0	0 15 0	12 2 6*	Little.	—, Chichester.
11	Clay	64	64	6 to 9	17	8	0 17 0	10 0 0	?	1s. 6d.* per acre	0 10 0	* Including horse labour. E. Goodman, Marlborough.
12	Clay and brash .. {	50	15	} 6 to 10	40	8	0 15 0	10 10 0	1 1 3	30 10 0	3 0 0	* Besides driver and water. W. Taylor, Bridgewater.
13	Light	130	130		31	4	0 5 10	4 10 0	1 14 3	18 12 0	?	J. Cattle, Chester.
14	Very strong	60	40	7	20	5	0 15 0	6 0 0	1 0 0	15 0 0	Heavy	G. Hewes, Baldoek.
15	Easy	62	62	4 to 5	21	6	1 0 0	6 6 0	1 19 6	14 3 3	5 0 0	—, Salisbury. * Water cart.
16	Generally light	47	47	8 to 9	21½	4	0 15 0	5 1 0	0 12 9	14 0 6	0 9 0	J. Bennett, Darenty.
17	Various	121	73	5 to 8	20	10	0 5 0	2 10 6	0 18 0	11 8 0	1 7 0	J. Toone, Lutterworth.
18	Chalky clay	20	20	8	6	1	1 2 6	2 14 0	0 6 0	5 0 0	?	J. Wallis, Kimbolton.
19	Heavy	62	71	8 to 10	22	5	1 0 0	11 0 0	1 2 0	26 8 0	Trifling	R. Moore, Bucks.
20	Deep wold	78	10	15	9	3	0 17 0	2 14 0	0 3 0	7 4 0	0	J. W. Day, Alcester.
21	Light	171	28	—	20	9	1 3 6	18 0 0	3 10 0	1s. 6d.* per acre	Trifling	T. T. Ruddle, Whitbury. * Not including water.
22	Loam	100	—	6 to 8	13	3	1 1 0	?	?	10 4 0	0	S. Ruddle, Wimborne.
23	Strong	101	77	6	21	6	0 16 0	8 0 0	1 0 0	13 6 6	0	J. Topham, Gt. Staughton.
24	Strong	42	42	5 to 6	6½	2	0 14 6	2 1 0	0 7 0	4 10 0	0	G. Martin, Boston.
25	—	24	24	5	8	3	0 15 0	3 0 0	0 4 0	4 5 4	—	J. W. Tubb, Banbury.
26	Loam	65	65	6 to 7	15	6	0 16 0	5 12 0	* 50s. 8-day covers everything.			M. Hanley, Boston.
27	Various	72	60	6 to 10	18	5	0 13 0	5 13 0	1 16 0	11 14 0	2 15 0	J. Long, Henlow.
28	Various	48	48	6 to 9	13	5	0 15 0	4 17 6	0 7 7	13* 2 2	0 8 0	J. Whiting, Stoke Goldington. * Including water.
29	Heavy	12	12	6	4	0	0 18 0	1 4 0	0 6 0	3 8 0	—	T. W. Dring, Long Sutton.
30	Various	90	—	6 to 9	25	7	1 0 0	12 10 0	1 5 0	21 17 6	3 15 9	W. Simmonds, Guildford.
31	Light	36	36	6	14	3	0 15 0	3 8 0	0 5 0	11 0 0	—	G. Pollington, Pyckley.
32	Heavy	65	—	9 to 10	15½	6	0 11 6	3 3 0	0 15 0	10 0 0	1 0 0	P. Stevenson, Thirsk.
33	Medium	62	50	4	21½	5	0 17 6	8 15 0	1 2 0	18 14 0	Light	—, Burford.

HOWARD'S APPARATUS.

[THE FOLLOWING ARE THE RETURNS OF WORK DONE THIS SPRING, UP TO MAY 18, REFERRED TO IN MR. MORTON'S PAPER BEFORE THE LONDON FARMERS' CLUB.]

No.	Soils.	Acres grubbed.		Depth of work.	Days at work.	No. of Removals.	Price of coals per ton.	Cost of				Address.
		1st time.	2nd time.					Coals.	OIL.	Wages.	Repairs.	
				Inches.			£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
1	Stiff clay, stoneless..	110	160	7 to 12	78	8	0 15 0	23 12 6	2 10 6	81 14 4	10 0 0	G. Taylor, Mentmore.
2	Loam	70 acres ploughed, and 72		9 to 12	20	4	1 1 8	8 4 8	1 0 0	20 10 0*	0 10 0	J. Bray, Havering. * Including horse labour.
3	Clay	157	107	5 to 12	42	6	1 0 0	25 0 0	1 15 0	30 0 0	little	W. Pike, Sterington.
4	Light	66	23	6 to 9	20	6	1 0 0	10 0 0*	1 0 0	16 0 0	?	Blyth and Squier, Mucking. * Estimated.
5	Loam	51	16	4 to 8	7½	3	1 0 0	?	?	9 18 1	?	J. Henderson, Sandvich. * Long days.
6	Various	..	106	8	15*	9*	0 18 0	7 0 0*	1 0 0*	14 10 0	little	W. Bulstrode, Maidenhead. * Estimated.
7	Clay and loam	..	76	10 to 14	9½	2*	1 5 0	3 15 0	0 9 0	6 10 0	?	W. C. Morland, Lamberhurst. * Occupying 1 day additional.
8	Gravel	..	60	8 to 10	9	3	0 17 0	3 6 6	0 9 0	5 3 6*	..	C. Street, Cople. * 1½d. per acre extra.
9	Stiff clay	50	50	6	13	3	0 16 0	5 4 0	0 15 4	12 10 0*	?	R. Barton, St. Ives. * 2s. 6d. per acre piece-work.
10	Stiff clay	30	54	7 to 8	?	3	0 16 0	?	?	10 10 0	1 15 0	E. Turney, Soudrop.
11	Strong clay	43	23	5 to 7	14	5	1 0 0	6 0 0	0 14 0	16 4 0*	0 9 0	W. W. Gascoigne, Sittingbourne. * Hired engine and engineer.
12	Stiff	10*	350*	6*	60*	16	0 11 0	17 0 0*	2 0 0*	37 15 0*	20 0 0	C. Sergeant, Northampton. * About
13	Strong loam	60	120	6 to 12	30	6	0 8 4	7 10 0	5 0 0	24 0 0	5 0 0	T. Nock, Shiffhall.
14	Various	12	77	5 to 8	?	4	?	?	?	0 15 6*	?	W. Cousens, Nore.
15	Loam and clay	58	40	6 to 8	19	5	0 10 0	4 15 0	0 19 0	18 1 0	10 0 0	R. Pullen, Wolverhampton.
16	Marl and clay	21	21	7 to 11	8½	2	1 0 0	4 0 0	0 18 0	6 1 10	0 7 6	J. Ford, Warwick.
17	Strong clay	35 36 ..	.. 35 36	6½ 6½ 8	6 6½ 7	1 1 1	0 15 6	2 6 6 2 10 0 2 4 0	0 5 0 0 5 0 0 5 6	4 2 6 4 7 9 4 2 6	2 0 0 2 0 0 4 15 0	J. T. Coleman, Denton, Lodge, Beds.

Mr. A. S. Ruston, of Chatteris, has deep-ploughed 118 acres from 6 to 8 inches deep. Wages 18s. a-day; no deep. He has also used Howard's steam harrows over 40 acres this winter, from 15 to 18 inches deep, with heavy travelling plough supplied to Mr. Howard; and grubbed Mr. Jarzzy, of Broomfield, near Chelmsford, reports that acres with excellent effect.

FOWLER'S APPARATUS.

[THE FOLLOWING ARE THE RETURNS OF WORK DONE THIS SPRING, UP TO MAY 18, REFERRED TO IN MR. MORTON'S PAPER BEFORE THE LONDON FARMER'S CLUB].

No.	Soil.	Acres.		Depth.	Days at Work.	Re-movels, No.	Coals per Ton.	Cost of						Address.
		Ploughed.	Grubbed.					Coals.	Oil.	Wages.	Repairs.			
			1st time.									2nd time.		
1	Heavy	..	180	100	38	18	20 0	16 8 0	2 10 8	25 6 8	£ s. d.	J. Dreher, Prince Consort's Norfolk		
2	Strong	..	270	123	65	15	14 8	34 0 0	3 4 0	48 16 0	.. 0	S. M. Plummer, Newbury [Farm		
3	Very stiff	..	43	131	61	17	18 0	21 12 0	2 15 3	37 8 0	5 4 6	Lord Berners, Keythorpe		
4	Moderately stiff	..	127	39	48	18	12 6	27 10 0	2 15 0	39 12 0	24 8 0	Grosvener Hodgkinson, M.P., Newark		
5	Clay and gravel	..	196	..	61	16	21 0	42 0 0	2 11 0	25 6 5	trifling	J. Frampton, Wallingford		
6	Stone brash and various	..	456	257	48	31	20 0	38 0 0	3 12 0	41 0 0	17 10 0	G. Edmonds, East Leach		
7	Various	..	22	118	46½	22	15 9	32 10 0	3 5 0	30 0 0	38 0 0	F. Dodd, Henley		
8	Heavy and light	..	141	57	41	11	18 0	22 10 0	1 17 6	21 3 8	5 0 0	E. Roberts, Jun., Bishop Stortford		
9	—	..	80	14	29	8	17 6	17 8 0	1 9 0	18 2 6	1 0 0	T. H. Redman, Swindon		
10	Clay	..	106	106	34	14	18 0	29 10 0	1 13 0	23 13 0	4 15 0	W. S. Allen, Rochford		
11	Light	..	196	..	35	10	17 0	18 0 0	1 13 0	23 12 6	little	J. Arnot, Carshalton		
12	Various	..	650	260	82	30	10 6	0 0 6*	0 0 2*	0 1 6*	15 15 0	T. M. Richardson, Hibernia		
13	Various	..	80	10	?	6	10 6	0 7 6	?	0 13 6*	?	W. Sadler, Ferrygate		
14	Various	..	273	296*	59	22	20 0	37 17 0	1 17 6	34 8 6†	?	J. M. Reed, Elkston		
15	Strong	..	53	23	17	8	25 0	12 0 0	1 17 0	12 17 0	3 15 0	* Draged. † Removes not reckoned		
16	Various	..	76	115	20½	9	18 0	8 2 0	1 0 6	18 5 11	4 16 9	J. Wallace, Teisworth		
17	Stiff Marl	..	315	220*	70	17	16 0	35 0 0	3 8 0	36 15 0	15 10 0	E. Marjoribanks, Henley		
18	Medium	..	78½	58½	39½	17	7 6	6 15 6	2 7 10½	25 14 7½	2 13 9	J. Coleman, Cirencester		
19	Chalk	..	132	..	25	7	14 0	7 10 0	1 5 0	16 15 0*	..	* Draged two times		
20	Clay, &c.	..	30	70	18	4	25 0	6 15 0	0 15 0	7 16 0	1 10 0	W. Lawson, Brayton		
21	—	..	154	52	40	14	12 6	20 0 0	1 13 4	30 0 0	5 0 0	* Exclusive of water		
22	Stiff clay	..	40	86	38	12	1 6	16 2 0	2 15 0	20 7 8	?	H. & W. Hole, Herteshury		
23	Light	..	..	..	5	1	16 0	2 0 0	0 2 6	1 16 8	0 0 6	* Including water		
												Rev. A. Hoxtable, Blandford		
												C. Lyell, Old Montrose, N.B.		
												J. W. Watts, Oringbury.		
												J. Elliot, Tarbert Mains.		

THE DRAUGHT OF TILLAGE IMPLEMENTS.

ASCERTAINED AT SUTTON COURTNEY, NEAR DIDCOT.

By J. THORNHILL HARRISON, M. Inst. C.E., & J. CHALMERS
MORTON, May 18—26, 1863.

Mr. PULLEN, of Sutton Courtney, having placed 30 or 40 acres at our disposal, chiefly of rather light soil, but very hard over gravel, which had been wheat in 1862, and had borne a crop of trefoil, since folded off by sheep, Mr. Fowler sent his recording dynamometers capable of reading up to 10 cwt., and 38 or 40 cwt. respectively; and with them the "tackle"—12-horse power engine, 4-furrow balance plough, 7-tined balance cultivator, &c., which he was to show at Exeter. Mr. Smith's windlass and grubber bought in 1858, and worked by an 8-horse power double cylinder engine by Robey, of Lincoln, had been long in use on the farm; and Mr. Howard sent his 3 or 5-tined cultivator from Bedford. The dynamometers were tested and verified immediately previous to their employment. The land was throughout in perfectly good order for work—though very hard below, owing to the drought, which had penetrated further than the rains which fell on the 16th, 17th, and 19th May. The following are the readings of the dynamometers:

I. HORSE-DRAWN PLOUGH.

Common Horse Plough.	Speed.	Draught.
	Miles p. hr.	Cwt.
Empty and drawn across the stubble	3	2½
Ploughing 4 ins. deep (10 ins. wide)	2½	4½
" 5 " "	7 1-5th	4½
" 5½ " "	1 2-5th	3½
" 7 " "	1½	4½
" 7 " "	1½	4½
" 9 " 10 +	1½	7½

This last was the utmost strain of three very powerful horses.

Draught of plough deprived of mould-board.

	Miles per hour.	Draught.
		Cwt.
Ploughed 5 + inches deep 3—		2½
" 9 + " " " " " 1½		7½

The depth was aimed at being consecutive inches, 4, 5, 6, 7, &c.: the depths actually ploughed were ascertained by measurement. The effect of speed on the draught is noteworthy—also the large proportion of draught due to the mere cutting parts of the plough.

II. STEAM PLOUGH AND GRUBBER drawn empty across fold and fallow, the fallow being a dry, friable, light soil, grubbed 6 inches deep.

(Over the unmoved dry sheep-fold).

Howard's 3 or 5-tined cultivator	1+cwt. draught.
Smith's 3-tined	½ to ¾ cwt. "
Fowler's 7-tined	2 cwt. "
Fowler's 4-furrow plough	2½ cwt. "

(Over the fallow).

Howard's cultivator	2½ cwt. draught.
Smith's	1 to 1½ cwt. "
Fowler's	2½ cwt. "
Fowler's plough	8½ cwt. "

III. STEAM CULTIVATORS AT WORK.

	Depth.	Weight of earth moved per yard.	Draught.
	Inches	Lbs.	Cwt.
A. Howard's 3-tined Cultivator	4	386	12
" " "	5½	472	18
" " "	6½	478	21

In these cases the drag of the back rope varied from ½ cwt. at starting, to 1½ cwt. at the end of the furrow of 176 yards, and from 1½ cwt. on starting on the return journey to 2 cwt. on reaching the windlass, only about 380 yards of rope being out, for the piece was close on being finished, about 6 or 8 yards in width remaining—close to the side where Fowler's tackle also was at work, finishing its side of the field, the draught being taken as near to one another in the field as possible. The weight of earth moved is given as actually ascertained, the incompatibility between measured depth of work and earth moved is unexplained.

Howard's cultivator was the 3-tined tool, moving a yard width at a time, with 6-inch points.

	Depth.	Weight of earth moved per yard.	Draught.
	Inches.	Lbs.	Cwt.
B. Smith's 3-tined Grubber	5	474	12
" " "	6	469	14½
" " "	6½	516	19

Smith's grubber works 30 inches wide at a time—it had 4½-inch points on. The bottom of the work was in furrows, unevenly cut, so that it was difficult to estimate the depth. The weights were ascertained in places indifferently chosen, and their incompatibility with the measured depths is unexplained. The back draught was the same in this case as in Howard's. The speed was an ordinary rate in all three cases, about 2½ or 3 miles an hour.

C. Fowler's 7-tined Cultivator, with 6-inch tines, moving 6 feet in width—

Depth.	Speed.	Back Rope.	Draught Rope.	Weight moved per yard.
Inches.	Miles an hour.	Cwt.	Cwt.	Lbs.
5½	1½	4	31	487
5½	2½	0	27	422

In the latter case horses drew the drag rope, which was detached from the plough. It took ½ cwt. at first up to 1 cwt. towards the end of the furrow. A third weighing, when the speed was slowest, yielded 544 lbs. per yard. The bottom was very uneven when the speed was great, and the earth moved was proportionately less.

Depth.	Speed.	Back Rope.	Draught Rope.	Weight moved per yard.
Inches.	Miles per hour.	Cwt.	Cwt.	Lbs.
6	3	5+	36	..
6½	1½	4½	31	562

On a subsequent day, the tool going the same depth, when going very slowly and doing very level work was found to have moved 720 lbs. in a square yard.

D. Fowler's 4-furrow Plough, with digging breasts, moving 40 inches in width—

Depth.	Speed.	Back Rope.	Draught Rope.	Weight moved per yard.
Inches.	Miles per hour.	Cwt.	Cwt.	Lbs.
5½ to 6	1½	4½	25	432
7 to 8	1½	6+	32	..
8+	3	7½	36	560

Another reading on the return journey when near the engine was as follows:—

?	3½	4½	30	..
---	----	----	----	----

And with anchor being moved in addition—

?	3½	6	31	..
---	----	---	----	----

8½	1½	0	24	..
----	----	---	----	----

In the above case the rope was detached from the plough.

0	2+	?	32	672
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9 to 10	1½	?	36	..
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E. Fowler's Plough, with four mould-boards turning 40 inches in width—

Depth.	Speed.	Back Rope.	Draught Rope.	Weight moved per yard.
Inches.	Miles per hour.	Cwt.	Cwt.	Lbs.
6½	2—	?	28	449
7½	2—	?	31½	493

IV. DRAUGHT OF ROPE.—Smith's rope drawn out around a 7 or 8 acre piece—by horse-draught from 0 to $1\frac{1}{2}$ cwt. to 1st snatchblock 110 yards off; 1 to $2\frac{1}{2}$ cwt. to 2nd snatchblock 180 yards further; 2 to 3 cwt. to 3rd snatchblock 150 yards further.

At end of 68 yards from 2nd snatchblock, i. e. between 2nd and 3rd snatchblocks, the draught was 2 cwt. with "break" as usual; 4 cwt. with "break" so hard as to keep the rope off the ground; $2\frac{1}{2}$ cwt. with no "break" at all. The porters stood at intervals of from 20 to 40 yards.

Again: Smith's cultivator going about 5 inches deep from the 1st to the 2nd snatchblock along a furrow about 300 yards long, the rope dragged beginning with 75 yards up to 275 yards from windlass; and the rope pulling it beginning with 470 and down to 270 yards long.

The dynamometer immediately before the grubber stood at 10 cwt. rising to 11 cwt. at end of furrow.

The dynamometer placed 200 yards from windlass—i. e., 270 yards in advance of grubber, taking in the drag of 270 yards of rope round 2 snatchblocks, began at 14 and ended at 18 cwt., indicating a waste of 4 cwt. between engine and plough.

This was working the apparatus, as Mr. Pullen had been accustomed to work it with comparatively few rope porters.

Fowler's Drag Rope is about one-fifth or one-sixth of the pull in all cases, as may, indeed, be read in many instances above; but this is not all additional work for the engine to overcome. It represents a taintless all round. The following readings were taken:—The rope was taken around the engine, clip drum, and anchor, 350 yards apart, and the heavy dynamometer was made a link in this rope. The engine then walked aside and tightened up the rope till it was tightly carried from porter to porter. The lighter dynamometer was then attached to the heavy one, and horses drew the whole affair round by means of it. The heavy dynamometer read 6 cwt., which was the tightness of the rope; the light dynamometer read $1\frac{1}{2}$ cwt., which was the work the horses did. From this deduct $\frac{1}{2}$ cwt., the ascertained draught of the heavy dynamometer, and $\frac{1}{2}$ of a cwt. was the work of drawing the rope round when of that tightness: when the tightness is 25 or 30 cwt., as when drawing a heavy cultivator at work, the waste by the rope must be greater than this, but has not yet been ascertained. When the anchor was at work, the draught by horses was $2\frac{1}{2}$ + cwt., representing 1 cwt. as the draught of the anchor.

On a subsequent occasion—when the heavy dynamometer was not in, and the strain all round was not ascertained—the draught without the anchor was $\frac{3}{4}$ cwt., and with the anchor $1\frac{1}{2}$ cwt., exactly corresponding with the above.

When the rope was imperfectly carried, the dynamometer read 3 cwt., and with the anchor $3\frac{1}{4}$ + cwt. When wholly dragged, the draught was 5 cwt. $\frac{1}{2}$ cwt. must be deducted in all these cases for the drag of the heavy dynamometer.

Near Bedford, June 2, an attempt was made with Mr. Howard's 3-tined cultivator, worked with Clayton and Shuttleworth's 10-horse power double cylinder engine, to read the dynamometer when at various kinds of work. The land was a hard, dry clay, unmoved since last autumn. The dynamometer was an ordinary elliptic spring, the indication of whose oscillating index was read with difficulty. It was found quite impossible to read the instrument when the tool was working, often with only one tine at work; but throwing out masses of hard clay 8 or 10 inches thick, and weighing from 70 to 100 lbs. a-piece, the index varied from 15 to 30 cwt.

Taking it afterwards along the fourth side of the square surrounded by the rope, i. e., next the windlass, where the land had been previously ploughed, the draught approaching the engine increased from 13 to 14 cwt., and going from the engine increased from 10 to 11 cwt. In the one case the pull rope was 150 yards at starting, and the drag rope 610 yards; in the other case the pull rope was 760 yards at starting, and the drag 0.

The dynamometer behind the tool, when approaching the engine, read $2\frac{1}{2}$ cwt. at starting, when the drag rope was 610 yards—dropped to 2 + cwt. in the middle of the furrow; and rose to 3 or 3 + cwt. towards end of furrow, when the drag rope was its full length—760 yards. This was when both break and the double snatchblock slack gear apparatus were worked as usual, the result being that the rope was well carried on the porters. The draught of the drag rope, when the

cultivator was being drawn from the engine, commencing with 0 and ending 150 yards long, was barely 1 cwt. without break, and about 3 cwt. when the break was hard on.

Again, from the first snatchblock to windlass, with drag commencing with 610 yards and ending with 760, the drag was $4\frac{1}{2}$ + cwt., without the slack gear; but, with break hard on, it was $2\frac{1}{2}$ only, with the slack gear as usual; but the rope was hardly so well carried.

Along the same furrow—another trial rope perfectly carried by break alone, draught	5 cwt.
With slack gear and enough of break as usually managed	3 to $3\frac{1}{2}$ "
Without slack gear and without break, the rope dragging the whole way (though carried on porter)	$2\frac{1}{2}$ "
Again—along the same furrow—another reading with break hard on	$4\frac{1}{2}$ "
With break and slack gear as usual	3—"
With slack gear or break (rope not carried) ..	2 "
With slack gear without break (rope carried better, but not well)	$2\frac{1}{2}$ +"

It is hoped that the circumstances of these trials are sufficiently well described to be understood. The lessons which they teach must be gathered by the reader.

Mr. Alderman Meehl said that in 1856, and, indeed, long before that, he was convinced of the importance of steam power in cultivation. In that year Mr. Fowler's steam plough, with Loocock's subsoiler attached, was used on his farm, in the presence of a very large number of practical and scientific men. He was bound to say that although the land had previously been deeply cultivated with the fork, some new soil was brought up—a yellow, miserable, tenacious, plastic clay—and yet ever since then his men said that the three lands so worked had year by year shown a superiority in crops. That was sufficient proof that there was something more in steam cultivation than mere economy of ploughing. He had long been so convinced of the necessity of deep cultivation, and of the shallowness of general culture in this country, that he had used an extra amount of horse-power, in breaking up the lower part of the soil, before the general introduction of the steam-engine. He used three horses for the first plough, and six for the following one; and that was the great ponderous Deanstone plough, which was presented to him by Mr. Morton, who had delivered so able a lecture that night. Mr. Morton told him that it had broken up the whole of the Ducie farm then cultivated by his father, and he had given it to him (Alderman Meehl) to perform a similar duty on his farm. Costly as it was in comparison with steam power, that cultivation had been very remunerative to him; for the present dry season—and in every dry season—those portions which were deeply cultivated retained a greener and healthier hue, while the ordinary shallow cultivation in the neighbourhood caused the crop to give up. That was particularly manifest this season, and if they wanted evidence on which to judge of deep cultivation, they would find it over the drains where the ground had been deeply cultivated. He used to be told that that was owing to the land being drier over the drains; but in dry seasons, it was those very parts which preserved their greenness and showed superior moisture. Without exaggeration—and he had watched the furrow-slices cut from the solid—without exaggeration, he believed that the general cultivation of the kingdom was not four inches in depth. Of course he said that guardedly; but if they looked at the butt end of the furrow slices close to the plough from the solid, he was convinced that the average was much less. It was, therefore, very easy to understand the economy of steam cultivation, for if it gave them only two inches more, it threw 200 tons per acre of additional earth open to atmospheric influences, and enabled the roots to do their work more

readily. There was one part of Mr. Morton's speech, in which he (Alderman Mechi) could not agree, and that was his remark respecting Baron Liebig. Baron Liebig, while he spoke of exhausting the soil, told them, in that wonderful book of his, recently published, "On the Natural Laws of Agriculture," that they had in all their clay soils, or in most of them, from one to four hundred times more manure than any one crop required; but he stated distinctly that these treasures were chemically fixed, that they were not in a physical condition for absorption, and that therefore, although the chemist might by fire and other means in his laboratory show that they had the elements of 400 or 500 crops, he could not tell them—for he did not know till Liebig explained it—that those treasures were so locked up that they were unavailable to the man that wished to appropriate them. But Liebig also said that if they separated the particles of the soil so as to make a way for the roots to go to each granule, then they would be able to avail themselves to a greater degree of those treasures, because he said water did not wash manure from one part of the soil to another, but it became fixed in one part, and unless they changed the surface by cultivation, the roots might be in one spot one year, and as it might not be in the same place next year, they would not be able to find the food they required. That was a very large question, and he would not go further into it to-night; but he would recommend every one that wished to impress himself with the extraordinary value of improved tillage to study Liebig's book. It would give him confidence in laying out his money in the purchase, even at a very large cost, of steam cultivators and ploughs. Taking another point of view of the effects of steam cultivation, he was sure it would cut into the vitals of agricultural prejudice to an extent of which no one could have dreamed. Some twenty years ago he had ventured to make war upon old pollards, small fields, and great fences. Landlords looked upon him as a very Utopian, and as one that wished to destroy the beauty of the country; but, depend upon it, the powerful effect of the greater profit of using 300 or 400 yards in a direct line, so ably quoted by Mr. Morton, had caused such a revolution as to make farmers observe what their neighbours were about, and declare that they would no longer have small fields, great fences, and large timber trees, except at such a reduction of rent as would make it worth the while of the landlord to remove them. This was one of the unmistakable results of this splendid application of steam-power to cultivation, and they need not go far from home for an illustration of what he said. Only last week he went, in company with some other sharp agriculturists (Hear, hear, and a laugh), to pay a visit to their hospitable friend the Chairman of that Club. In going from Guildford, in the direction of Knowle, about nine miles and a-half, on a fine May morning, they really fancied themselves in Canada (laughter). They were positively amazed at the primitive, unaltered condition of those miserable little fields, those undrained lands, and those great timber trees. Why, their roots must have almost crossed through the field—their tops certainly did. After travelling nine miles through such a country, they came at length to two farms, one of which belonged to their President, and the other to Mr. Cousens, who was also present in this room. On those farms were two steam-cultivators; and, in spite of ladies' objections, and sorrowful exclamations that it destroyed the beautiful country, the little fields and the great fences had vanished. Instead of them they had fine open fields; and he was bound to say, from what he had observed, that the use of the steam-plough

would give agriculturists much larger and more extended views than they had entertained before. Depend upon it, steam-ploughing upon stiff clays would have been impossible without first draining the land; for they knew that to grab deeply a piece of ground that had not been drained, was to make a mere mud-pond of it in the winter, and to make it very difficult indeed to work in the spring. He entirely agreed with what Mr. Morton had said with respect to the greater efficiency and excellency of the work done by steam. Good-natured ploughmen always liked to see their horses fat. He had removed the earth, where they had ploughed, from the stetch, and then had been revealed to them the miserable inequalities—the easings and risings and fallings of the ground according to the action of the plough. But with the steam-plough they saw a plain smooth surface, very different from what was the case with the horse plough. Since they had been in that room the Chairman had assured him that, comparing steam-ploughing with steam-grubbing—which he had done in one field—the part which was grubbed and not ploughed was very superior as to crops, to the part which was grubbed and then ploughed. They must all agree that a planed surface for the roots to work into was quite inconsistent with the law which Liebig had laid down, namely, that they should give every facility for the roots to come in contact with the soil, because they did not take their manure from the solutions that were put in, but they took it from the granular surface of the soil, a thin layer of water and of air being interposed between the root and the granule (cheers).

Mr. JOHN WILLIAMS, of Baydon, Hungerford, had had, as they well knew, considerable experience in this matter, and he wished therefore to make a few remarks upon it. Eight years ago, as Mr. Morton had remarked, he read a paper in that room with reference to steam cultivation; and that paper was afterwards published in the *Journal of the Society*. On that occasion, he (Mr. Williams) predicted, after the three years' experience which he had then had, and which he was labouring almost alone to develop, that they would one day plough and cultivate their land at 5s. 8d. per acre; and he felt highly gratified by the results of practical experience in these days, that he at that time saw so clearly into the future. He predicted that, long before any practical man present had ever dreamed of cultivating land by steam. The elaborate paper which had been read by Mr. Morton required very little addition; and he would therefore only corroborate by his own experience what had been stated by that gentleman. There was one point, however, and that rather a vexatious one, to which he wished to allude. Mr. Morton had shown the practical result of steam cultivation; but they were not to suppose that there were no hindrances or difficulties in the way; and he would therefore allude to the obstacles to steam cultivation, rather than to its practical results. Their friend Mechi had just pointed out that he set the example six or seven years ago—[Alderman MECHE: Twenty years ago]—of grubbing up pollards, and removing other things which Mr. Morton stated were great obstacles in the way of steam cultivation. Now the aristocracy of England, instead of looking to practical results of steam cultivation or its necessities, look rather to the picturesque ("No, no!" and "Question!"). Now he (Mr. Williams) protested against that view of the case. The aristocracy must yield upon this point all that the practical farmer required of them. One of the greatest obstacles to steam cultivation was the numerous and crooked fences too often to be met with. The practical farmer entered a field, and there he saw a tree in the very centre; and that tree, if grubbed up, was perhaps worth a sovereign, or, if a very good one, thirty shillings or fifty shillings. But what

was the result of its standing there to the tenant? He would undertake to assert that, for every shilling it produced to the landlord, it was a sovereign out of the tenant's pocket. The exigencies of steam cultivation required from the aristocracy that such obstacles should be removed. He had studied steam cultivation for eleven years, and he was pretty well able to say what were the obstacles which it had to encounter. If they must maintain the picturesque appearance of the country, let them plant the margin of fields with trees, but do let the trees be swept away from the centre. If their friend Mechi had done no other service to British agriculture than to point out the necessity for an alteration in this respect, they would owe him a debt of gratitude (Hear, hear). Another obstacle to steam cultivation was this—though he knew he touched upon tender ground when he mentioned it, and he knew also that it would go against the grain with some individuals present—he referred to the result of a recent trial which had taken place with regard to patent rights ("Question!") The question on the card for that evening was "The Present State of Steam Cultivation," and he said that this matter had a great deal to do with the present state of steam cultivation; for the pioneers of steam cultivation had plenty to do with their money without expending it in legal contests.

MR. FOWLER: That is hardly germane to the question (cheers)

MR. WILLIAMS would not treat the question as a personal one, because both the parties were friends of his own; and was that the only case in question, he should not have dreamt of alluding to it, but he knew of at least a dozen other cases, where the pioneers of steam culture and others, unscrupulously took possession of the patent rights of another without leave or license, leaving it to the owner to obtain his right by such an expensive process as he had mentioned. Surely this ought not to be! What they wanted was the best implement that could be produced by experience, talent, and money; and if one party had got a part of his patent which would benefit another, he should let him have it, by his paying a reasonable and fair price for it, and acting on those high and honourable principles, above such actions as he had mentioned.

The CHAIRMAN intimated that the subject must here stop, and

MR. WILLIAMS resumed his seat.

MR. J. COLEMAN (Park Farm, Woburn) said he did not think he would have risen but for some of the remarks of Mr. Williams. It had often been said that what was learnt in youth was never forgotten. He had no doubt that forty years ago Mr. Williams or Mr. Williams's father had some peculiar experience with regard to the grubbing up of trees, or rather with regard to some landlord who would not allow them to be grubbed up. Now he must say that so far as he (Mr. Coleman) knew anything of landlords, he had certainly had to do with some of the best of them (Hear, hear). They had always been quite willing to do their utmost to enable their tenants to adopt steam cultivation; and let those whose landlords were not willing to do so only offer them a few shillings per acre additional rent, and there would be no hesitation on their part in granting what was wanted (Hear, hear). That was an instance which might be brought to bear on landlords generally with very good effect. An offer to pay an increased rent would remove a great many obstacles like those to which Mr. Williams alluded. As a practical man he wished to ask Mr. Morton a question. Living in Bedfordshire he had seen there very little of any system of steam cultivation except one; though six or seven years ago, when living in Norfolk, he used a set of Fowler's tackle. He was a light-land farmer, and

was anxious to adopt steam on light land. Whether in Bedfordshire or Surrey, they did not wish to be behindhand; they wished to adopt that system which was most economical; and if Mr. Morton, who had seen at work on light lands both Fowler's and Howard's apparatus, would give them the result of what he had seen, it might confer great benefit on them. Those who had been using only Fowler's or only Howard's apparatus, could only give an opinion as to what had been done in their own case; there were very few farmers who had had opportunities of judging between the two. He might instance his own case: he should very likely go against what Mr. Morton said as to the most efficient mode. The other day he saw at work in his own county a set of Fowler's machinery, which was not doing its work as it ought to be done. He went to another place and saw Howard's machinery doing its work admirably; but he could not forget that in the one case the machinery was working under the master's eye, while in the other case the master was at a distance. Seeing those two modes in operation, he asked himself as a farmer what judgment he should pass on them. He might think, from what he saw, that Howard's was running away from Fowler's; but then he might be mistaken. They all knew that both those modes of steam cultivation answered: the question for them as farmers was, Which answered best? (Hear, hear).

DR. ELLIS (Sudbrook Park, Richmond) said his interest was like that of the last speaker. He also cultivated light land, and he was anxious to find how he might cultivate such land hereafter, in order that he might obtain greater profit from the produce. Some time ago he inserted an advertisement in a local paper, asking for the name and address of a man in Surrey who had made a fortune by farming (laughter). He there promised that if the name and address of any such person were furnished, he would bring all the farmers in the neighbourhood to see him, and that they should pay a shilling a-piece (laughter). To that advertisement he received no answer. The old system of cultivating by horses proved there was not much profit to be made by farming. The progress of steam cultivation proved very favourable on stiff lands; but for its application to light lands was there not required less expensive machinery? It was not clay soils alone that contained nutriment for plants; sandy soils also contained what produced good remunerative crops. Many farmers occupying two or three hundred acres of light sandy soil, who would not like to incur an outlay of six or seven hundred pounds for the machinery suitable for heavy land, would perhaps be quite willing to purchase less expensive machinery for the cultivation of their light soil.

PROFESSOR VOELCKER (Cirencester) said this was one of those practical subjects upon which all must consult their individual experience. There were, however, some points on which he wished to offer a few remarks. It appeared to him that a sufficient distinction had not been made between the very worst description of land, upon which they must put everything in order to get crops, and land from which they might take almost everything out, if that were possible, and where, according to Baron Liebig, they pursued a robbing system. Now, he maintained that the best kind of land contained the treasures, not merely of one hundred years, as Alderman Mechi said it did, but of thousands of years. The difficulty, however, was to get at those treasures; and the question was not, as Baron Liebig justly observed, What was the amount of nutriment in the soil? but, What was the amount of nutriment in that portion of the soil which was reached by the plant? They must, therefore, work the land in order to get the treasures out, and the more they worked good land like that to which he alluded the better it became. They need not

be very careful, he thought, about restoring to such land everything what was taken from it. On that point he differed from Alderman Mechi. He believed that if it were possible to incorporate 8 cwt. of guano per acre uniformly with the whole soil they would see but little result, because the quantity of fertilising matter thus added to the land was very insignificant in comparison with what existed in 6 or 8 inches of soil. But the case was very different with respect to very light lands. In that case they must put almost everything on the land. And even there deep cultivation was of great utility, for on such lands the manuring constituents were washed out. Notwithstanding Baron Liebig's opinion that the soluble manuring matters were rendered insoluble as soon as they came in contact with the soil, it was plain that they were washed out. Where did the manures go? Why did they want manure for light lands? Why did they not see any effect when they manured them in autumn? Nobody could be a stronger advocate for the manuring of light sands than he was, but it was useless to manure them in autumn. At the same time he could quite conceive that there was great benefit arising from deep cultivation, even on sandy soils. They frequently broke—this was the case in Bedfordshire—a hard caky clay covered with a crust of sand. Unless they broke through the crust it was impossible to get a proper vehicle to hold the prepared manure, and the deeper this vehicle was manured the better for the plants. He believed, in fact, that deep cultivation on sandy soils was of great utility, because it increased the pabulum for holding the prepared manure. Whether that was most effectually done by horse or by steam power was another question. On that subject he hardly liked to offer an opinion, it was one which was so much better dealt with by men who had had practical experience in the matter; but speaking from what he had seen, if they would not be too hard upon him—he was here rather expressing his feeling than an opinion—he would remark that he was inclined to believe that on light lands, where they could plough with two light horses, the work would be done as well as it would be by steam. If he could do the work with two nice little quick-stepping horses, he did not think he should use a steam engine, of the present form at least, of 10 horse-power or even of 8 horse-power (Hear, hear).

Mr. T. B. DRING (Claxby, Spilsby) said a gentleman had asked what was the value of steam cultivation on light land? He (Mr. Dring) apprehended that such land was more liable to run to twitch than any other land, and that if a blow be made by steam power on the wheat stubbles that came in turn for turnips just after harvest it would be in a ready and safe state, but if this be omitted, if a wet spring happened to follow, the twitch could not be got out. The result of the twitch might be that the farmer would get a quarter of barley per acre less, and also a quarter of wheat after the seed crop; and the price of these would pay for a little extra power in the form of steam (Hear, hear.) Steam-power, after all, was not very expensive in the long run. He had now in constant use one engine, which he bought of Messrs. Clayton and Shuttleworth in 1855, and the expense of keeping it in repair had been quite a two-penny-half-penny affair (Hear, hear.) He always brought that engine out after harvest, and the result of employing it was that he had but little to do all the rest of the year: he had plenty of time to go to the Central Farmers' Club or anywhere else (laughter and cheers.) He certainly did think, therefore, from experience, that it was an advantage to be able to apply steam-power on light lands; and it was clear from what had been stated that evening, on good authority, that the use of steam-power was a very great advantage on heavy lands (Hear, hear.) It was remarked by

Alderman Mechi, that where lands had been underdrained to a depth of three feet, you could trace the effects on the surface over the drains, even in a dry season. He could corroborate that remark from his own experience. A short time ago he was looking at a field of his, which was underdrained twelve or fourteen years ago; and the consequence of underdraining was, that there was double the quantity of grain, even in this dry season (Hear, hear.) Did not that tend to show that the use of steam-power by preventing the lands from being trodden down rendered it more productive? Wherever he had broken up his stiff land the crops had been better afterwards. This year, for example, his best wheat was on land that was steam-cultivated (Hear, hear); finer wheat he could never wish to grow. The cost of a new engine and tackle was no doubt considerable; but it was no greater than that of good horses, coupled with their keep, shoeing, farriering, and deterioration, which formed altogether a considerable item. Nothing connected with his engine, which, as before stated, he had had for several years, had been very expensive, unless it were the rope. The rope was, in fact, the greatest drawback (Hear, hear.) On a flinty soil the wear-and-tear of the rope was considerable; but on a loose loamy soil it was not much. He was quite convinced that the rope should be kept above the surface of the land at any cost, even by using a double number of rollers. He might remark, that on his own land the tar was not worn off after very long use, where the rope did not touch the ground. After listening to the reports which had been read that evening, they ought as farmers to feel very much indebted to those gentlemen who had spent their time and their money in endeavouring to bring agricultural implements as near as possible to perfection. Messrs. Howard had taken great pains, spent a great deal of money, and done a great deal of good; Mr. Fowler, a man of ten thousand, had fagged in the most unwearied manner; and great credit was also due to Mr. Williams and others, for the energy which they had brought to bear on the improvement of steam-cultivation. But all the honours were not due to those men; great honour was also due to the man who started the hare. The development of steam-power as applied to the land had been a very nice little game throughout; there had been a great deal of amusement as well as benefit, and some credit should certainly be given to the man who started the hare in Mr. Smith of Woolston, as well as to those who had made the running. He (Mr. Dring) was, he believed, the first tenant-farmer in England who bought, in a humble way, a set of steam tackle. That tackle was provided for him by Mr. Smith, and though he had had it for some years, he was prepared to run it against the apparatus of any modern manufacturer (Hear, hear).

Mr. J. FOWLER (28, Cornhill) said there was one subject which he thought worthy of more consideration than it had yet received. Mr. Mechi remarked that he had cultivated his land deeply by horses. Now that was a view which he had often heard expressed. He had often heard persons say, "I have done the same thing by horses that you have done by steam; I have cultivated land one foot deep by horses." Now, in that lay the error—a want of perception of the true bearing and merit of steam cultivation. He believed that the worst sort of tackle ever sent out was better than horses, and for this simple reason—he had sent out some bad ones himself, and therefore he could speak authoritatively on the subject (laughter)—that if they turned back a furrow that had been ploughed by horses, especially if they had the number of horses required to plough heavy land, they would find that the footmarks of the horses made the soil impervious to moisture. The consequence was that if they broke up that land in the autumn, they would have to do it over again in the spring. The wet being unable to percolate through the subsoil made the surface what they had no doubt all had seen on heavy land—a very nice tilth on the top, with something below like liver. That liver had to be clod crushed and harrowed in the spring, and it never became a fine tilth. But let them put the steam-plough on that land in the autumn, or let there be spade-labour, which was the same thing—though he really believed that steam-cultivation was very often better than spade-labour—and the land would be broken up in large

pieces, and the larger the better. Let it then be dry during the winter season, and the atmosphere would set on the surface, and the frost bring it down.

Alderman MEOCHI: If there is a frost.

Mr. J. FOWLER: Well, they were seldom without a frost. They would then have as beautiful a tilth in the spring, newly harrowed, as they could possibly desire. He could not help remarking that when persons talked merely of the cost of the first operation in steam-cultivation, they did not hit the point; what they had to do was to consider the cost of the first operation in connection with the cost of the subsequent operations. Mr. Dring was, he believed, quite correct in what he said with regard to the cleaning of light lands in stubble. The difficulty of cultivating land by horse-power was this, that when the horses walked a second time over the land, they put as much twitch in it as they ploughed out, so that it was impossible to clean land as thoroughly by horse as by steam-power. He believed that the more steam-cultivation was viewed in connection with subsequent operations, the higher would it stand in general estimation.

Mr. J. THOMAS (Bletchae) thought gentlemen who advocated the employment of steam power materially damaged their case by stating too much instead of giving simple facts (Hear, hear). For example, it had been remarked that evening that land could be ploughed at 8s. 6d., 3s. 4d., and 2s. 9d. per acre. Now, he would defy any one to prove that. Harvest time was now approaching, and he was prepared to place 50 acres of his own land at the disposal of any steam-cultivator, and he would give them 10s. per acre if he would steam-cultivate it and turn it over at least six inches deep (Hear, hear). Let not the advocates of steam-cultivation deceive people; let them not say certain things could be done when they were in fact impossible. He had been a farmer long enough to know that such statements as he referred to were not consistent with facts. Dr. Ellis thought it was desirable to turn all sorts of soil to the top; but he (Mr. J. Thomas) imagined that if the bad soil were at the top, the good must be underneath (Hear, hear). He thought all practical men would agree with him therefore that Dr. Ellis was mistaken on that point. As regarded the cultivation of light land Mr. Fowler said a great deal about the effect of such land being trenched by horses. They all knew very well that it was not in the autumn, when the land was wet, that twitch was got out; that must be done when the land was dry. The pressing of horses' feet was not injurious in all cases; on the contrary, in Kent and other parts of the country, it did a great deal of good on some land—Mr. Meochi shook his head. He would ask him why, if that were not sometimes necessary, farmers used Crosskill's pressers?

Alderman MEOCHI observed that they were not used while the stubbles were being cleaned.

Mr. THOMAS continued: That he agreed with the remarks which fell from Professor Voelcker, as to the ploughing of light land by steam power. He (Mr. Thomas) thought there must be a very great improvement in steam before its advocates could pretend to compete, by means of anything he had seen in the shape of an engine on light land, with horses (Hear, hear). Notwithstanding the views which he had expressed, he was watching the progress of steam (Hear, hear), and, no doubt, he would some day become the owner of a steam-cultivator (Hear, hear, and laughter); but he certainly thought it was a great mistake for persons to say that steam-cultivation could do what was manifestly impossible. Let them state facts, and nothing but facts (Hear, hear).

Mr. ARNOT (Woodcote, Carshalton) said he had not intended to speak on that occasion, but he really could not sit still after what had just fallen from Mr. Thomas. He could bear out the facts which Mr. Morton had stated on his authority, and he hoped others who had been quoted would imitate him in this respect. If Mr. Thomas would only take the trouble to come down to his farm, he would there give him all the information he could possibly require. He bought a steam cultivator four years ago, and he could show Mr. Thomas from his books what steam-cultivation has cost him to a farthing an acre.

Mr. C. HOWARD (Biddenham, Bedfordshire) said some of the statements quoted by Mr. Morton were given as if they included the three operations of harrowing, scarifying, and ploughing, and that probably was what con-

stituted his friend Mr. Thomas. They all knew that a steam cultivator could scarify and harrow a larger quantity of land than it could plough. It did not serve the cause of steam cultivation to put forth statements in a manner that was sure to create disbelief or doubt in the minds of tenant farmers and cultivators of the soil. If the friends of steam cultivation wished to serve themselves and the country in this matter, they should place their statements before the public in a reliable form. To blend all these operations in one item is wrong. He was not surprised at Mr. Thomas's getting up, and expressing doubts on the subject. As a practical farmer he (Mr. C. Howard) entertained doubt when he heard of men cultivating land by steam at 2s. 8d. an acre; and that had been actually stated that evening. If it were put clearly that the scarifying, ploughing and harrowing each came to a certain amount, then he could understand the matter; but when it was said that land was cultivated by steam at 2s. 8d. an acre, all he (Mr. C. Howard) could say was, that he did not believe it (Hear, hear). In conclusion, he would remark that they damaged steam cultivation who stated too much in favour of it (Hear, hear).

Mr. JAMES HOWARD (Bedford) thought that some gentlemen had been rather too severe on those who had been at the trouble of making reports with regard to their experience of steam cultivation. He did not say that all the estimates put forward were correct, but he believed that the great majority were so. He would impress on those who wrote reports on this subject to take care that the cost of repairs and the interest of money were taken into account. Mr. Thomas had said he would give anybody 10s. per acre for ploughing 50 acres of his land not less than 6 inches deep. It should be remembered that when persons had invested from £500 to £1000 in apparatus, it would not do for them to cultivate for others at cost price. There must be a margin for profit. Therefore, even if a person declined to plough for 10s. an acre, it must not be assumed that the cost of ploughing to the farmer was not less than that when he had his own engine and apparatus. Mr. Morton said in his paper that there was a greater loss of power by the roundabout system than by the direct system. Those who advocated the roundabout system had admitted that, to some extent it was so; but he thought Mr. Morton was not at present in a position to draw correct comparisons, inasmuch as he had not experimented with the best and most perfect apparatus on the roundabout system, in which the slack rope was kept entirely off the ground, not to state how much the loss of power amounted to. He believed that Mr. Morton's experiments had been made with machinery which was not of the most modern construction, and he (Mr. James Howard) hoped that in a few days he should be enabled to give him an opportunity of testing some apparatus on the roundabout system, in which the slack rope was kept entirely off the ground, while other improvements were introduced to lessen the loss of power. They all knew that each system had its advantages. Last year he endeavoured to put those advantages before the club as fairly as he knew how. The advantage of the engine being stationary was, in his opinion, greater than the small gain in power by working direct. He quite agreed with Mr. Dring that a great deal of work might be done with the lighter and cheaper apparatus, and that economically. It was well to remember that steam power was not an entire substitute for horse power, but rather an auxiliary; and persons who had only two, three, or four hundred acres of land to be operated upon by steam in a season, could certainly get all the work that was required to be done on the farm by an apparatus of eight or ten horse power, and consequently of much less cost.

Mr. G. R. G. RALPH (Uck, Monmouth) said a great part of Monmouthshire would require its fields enlarging, and trees removed, before the steam plough could be used; such being the case he should be glad if Mr. Morton or some other gentleman who had considered this matter would state what in his opinion was the shortest furrow on which steam ploughing could be introduced at a profit. He had heard it stated that a six-acre field was the smallest field on which the common plough could be used advantageously, and he would like to know what was the shortest furrow that would do for steam?

The CHAIRMAN did not think any one present was prepared to answer that question.

The CHAIRMAN said as the time had now arrived for ter-

minating the discussion, which had been one of great interest, and as he had had a little practical experience with respect to steam cultivation, he should, departing in that respect from his usual course, make a few concluding remarks (Hear, hear). In the first place he wished to thank Mr. Morton, personally, for the able manner in which he had introduced the subject. He had long watched the published expenses of Fowler's, Smith's, and Howard's operations, and, after having applied his best judgment to them, he thought there was very little difference in the expense of a single operation. Of course one machine entailed on the farmer a much larger immediate outlay than another; but that was a matter for his own consideration. Some time ago he started with Smith's steam grubber; and he thought he should forfeit the position in which the club had placed him if he did not now give a candid opinion of his subsequent experience. He was no favourite of Howard's, Fowler's, or Smith's machinery; but he stood there to give the result of his experience faithfully (Hear, hear). He did not know anything of Fowler's steam cultivator, except from having seen it on one or two occasions at the trials of agricultural shows, which were the last places he would go to for the purpose of gaining experience with respect to an implement (Hear, hear). Mr. Smith's implement had done very good work for him. Mr. Howard sent him, early in the spring, a new implement. It was used, and did its work very well; but, the engine being an eight-horse one, and a portion of the rope having been originally made for him in 1881, the latter broke so repeatedly, that he was obliged to set aside Mr. Howard's machine with the six-inch wings, and to cultivate the remainder of the field with Smith's three times. If he had had Mr. Howard's new rope and a ten-horse engine, he would probably never have substituted Mr. Smith's implement for Mr. Howard's. On the previous Saturday, when he came to the crossing, using the three-time Howard with the six-inch wings and side harrows attached, Mr. Howard's implement showed itself to be the best implement. These were facts; the club would take them for what they were worth. He would now mention another case. In a portion of a field of 30 acres he attempted the other day to use Howard's implement, and the rope broke, not being sufficiently strong for dragging. He then used Smith's implement, and the soil was broken up into large clods. When the rain fell a fortnight ago, on applying horse drag harrows these clods all disappeared. He was one of those who thought that steam was in its infancy, and that traction power would be applied to land in every possible way, and with far more ease than it was at present. On Saturday, Crosskill's roller, rigged out with Smith's turnbow, and having a pole attached to it, followed by a nineteen-tire Nottinghamshire drag attached to the roller—the same drag that a few years ago was described, by a gentleman who traversed this country, as a most barbarous implement—was working on his farm most satisfactorily; in fact, they could accomplish just fifteen acres a day. He mentioned that to illustrate the various uses to which steam power was now being applied. He had been making some calculations as to the saving of steam, as compared with horse-power. He already had an experience of nearly three years, and the result of his experience for the last two years was that the cost of the steam-engine, tackle, &c., would be cleared by the end of this year (Hear, hear). Was not that a sufficient encouragement to employ steam? (Hear, hear.) As regarded the cost of steam-power, compared with that of horse-power, he felt perfectly satisfied; and equally convinced was he that the work was done by steam in a very superior manner.

Mr. MORTON then replied: He said he could assure Mr. Charles Howard that he was not in the least abashed by the somewhat ferocious onslaught he had made on his figures. When he read the paper he would find all his statements sufficiently explained and justified by the explanation. The fact that seemed to have given to Mr. Howard a colouring to the whole of his paper was a single instance given by Mr. Taylor of Mentmore, where he described a certain amount of ploughing, grubbing, and harrowing extending over 450 acres. That was, he believed, the only instance in which there was not a proper separation of the different expenses. As regarded Mr. Thomas's remarks, suggested also perhaps by Mr. Coleman, as to the cost of ploughing light soils, he had not the smallest doubt as to the accuracy of the figures which he had given.

Mr. COLEMAN said he did not doubt the figures.

Mr. MORTON continued: Well, the figures justified the statement made (Hear, hear). Mr. Dring had handed to him a paper showing that he grubbed 17 acres of land three times, and that the expense was as follows:—£1 16s. for 2½ tons of coal, 4s. for oil, £1 0s. 9d. for wages, and 1s. 6d. for repairs, in all £6 2s. 3d. The 17 acres were, he believed, done three times over (equal to 51 acres) in 6½ days. The cost, which is correctly named, is exclusive of the wear of rope and tackle, and the setting down and taking up. [Mr. DRING assented.] Well, that was 2s. 5d. per acre or thereabouts. They had had the old story that so and so was impossible over and over again, and particularly in relation to steam-ploughing (Hear, hear). In the case of Mr. Plummer, to which he had alluded, the rope was included, and there the whole cost of ploughing and grubbing came to 5s.; in other cases the cost was shown to be 4s. per acre, the rope not being included, and experiences had shown that 1s. per acre was the proper charge for rope. As regarded light lands he thought that Mr. Dring's case, Mr. Giles Edmond's case, Mr. Arnot's case, and others referred to in his paper, were sufficient to prove his assertion that the cheapness of steam-cultivation was especially seen on light lands: though the greater value of such cultivation was seen most on clay lands.

Mr. C. HOWARD said, in rising to propose a vote of thanks to Mr. Morton, he wished to set himself right with the members of that Club, as regarded this subject. No one estimated the advantages of steam-cultivation more highly than he did; and it was because he was so jealous with regard to its success that he was anxious that statements should not go forth which the public could not believe. He begged to assure Mr. Morton that in what he had said he was far from intending to make a ferocious assault either on him or on those who had given him the results of their experience (Hear, hear). On the contrary, he thought Mr. Morton deserved their very best thanks, and he now proposed that they should be given, for his able paper (cheers). As one, however, who had seen as much of steam-cultivation as most gentlemen in that room, he certainly wished to caution those who desired to serve the cause of steam-cultivation against overstating the case (Hear, hear). He had seen a good deal, and he knew a good deal about what had taken place in connection with the use of steam-power. The Chairman, in replying to Dr. Ellis, had alluded to a man who he said made a fortune in Surrey. All he would say on that point was, that if the farmers of Surrey paid any rent, they ought not to do so, if he might judge from what he lately saw growing there (laughter). He had no doubt that their chairman was one of the best landlords that a tenant could have, and that might account for his tenants having made a fortune.

Mr. COLEMAN seconded the motion, which was put and carried.

Thanks were afterwards voted to the Chairman, and with this acknowledgment the proceedings terminated.

QUICK WORK IN COAT-MAKING.—In 1811, Sir John Throckmorton, a Berkshire baronet, offered to lay a wager of a thousand guineas to the following effect:—That at eight o'clock on a particular evening he would sit down to dinner in a well-woven, well-dyed, well-made suit, the wool of which formed the fleece on sheep's backs at five o'clock on that same morning. It is no wonder that, among a class of persons accustomed to betting, such a wager should eagerly be accepted, seeing that the achievement of the challenged result appeared all but impossible. Mr. Coxetter, of Greenham Mills, at Newbury, was entrusted with the work. At five o'clock in the morning, on the 28th of June, he caused two South Down sheep to be shorn. The wool was washed, carded, stubbed, roved, spun, and woven; the cloth was scoured, fulled, tented, raised, sheared, dyed, and dressed; the tailor was at hand, and made up the finished cloth into garments; and at a quarter past six in the evening Sir John Throckmorton sat down to dinner at the head of his guests, in a complete damson-coloured suit that had been thus made—winning the wager, with an hour and three-quarters to spare. Of course every possible preparation was made beforehand; but still the achievement was sufficiently remarkable, and was long talked of with pride among the clothiers.—*Chambers's "Book of Days."*

BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

MEETING AT EXETER.

It might perhaps have been better to head this report with the title in full of the institution under whose auspices the Meeting of the past month was celebrated—that is, “The Bath and West of England Society for the Encouragement of Agriculture, Arts, Manufactures, and Commerce.” It is true, that upon the revival of the association some dozen years since, its operation was almost entirely directed to the interests of agriculture; the very idea, indeed, having been suggested by the visit of the Royal Agricultural Society to the city of Exeter. The main duty of the show, however, has now gradually come to centre on its support of the buckle; and Arts, Manufactures, and Commerce by this take a very prominent position in a festival whilom so essentially devoted to the business of the farm. The West of England Show is, in fact, training on to a kind of small International Exhibition, duly provided with almost every description of nick-nack: glass, china, jewellery, cutlery, carving, drawings and paintings, backed by an Art-Union lottery for the more ready disposal of these wares and ornaments. There may be no great reason to quarrel with any such an extension of the programme; although for some years past the Council of the National Society have found it necessary to weed out the extraneous entries from their implement catalogue—a section of the show, where, after all, the innovation would be the most felt; as we are rather inclined to think it was felt at Exeter. But the half-crown's worth by no means ends here, even with a stroll through the stock classes, the implement avenues, or the Fine Arts' exhibition; a capital poultry show, a model conservatory, and a pretty little display of plants and flowers, being all included in the one admission-charge. Certainly every variety of taste has been carefully consulted, and there is no question but a goodly number of the visitors gave as little thought to the prize bulls as they did to the patent drills. Still, there was a good long week before those who had made up their minds to see everything, from the public judging on Monday, to the dog-show that did not open until Thursday or Friday.

The meeting, in truth, commenced at least a day too soon, and, as a consequence, the proceedings upon both Monday and Tuesday were somewhat tame and dispiriting. No question but that it might answer to have an Exhibition of Arts open for a fortnight; but it is too much to expect the owners of valuable animals to keep them out for a whole week at a meeting of the calibre of the West of England Society, the more particularly when the Royal does not ask even more of them. This may be some cause why the show of stock does not, numerically at least, make much progress in the West; a fact especially observable in the first division of the catalogue, where, in the very capital of their country, the Devon classes reached in

all to only forty animals. Many of the most successful exhibitors, such as Quartly, the Daveys, and Halse, again held aloof, most probably in some dread of so trying a preliminary for their Worcestershire champions. Whereas, had the public judging at Exeter been set for Tuesday or Wednesday morning, and the meeting over as usual on Friday evening, we cannot help believing that the Devonians would have supported their own show in far more force. In the class of old bulls there was not an entry from any herd of much distinction in the county; both the premiums, indeed, going to beasts bred and “owned” out of the district. Mr. Treffry's first, a straight upstanding animal, but with a hardish touch, was no higher than second in the week previous at Truro; while Mr. Farthing's more famous Viscount, in better form than at Wells, has still never thoroughly recovered from his early forcing, and, though a great wide bull, has grown out of shape, with a loose bad quality when you get your hand upon him. Both these elders were fairly eclipsed by Mr. Newbery's three-year-old, a deep square bloodlike animal, with fine flesh, and a beautiful bull's head and bright eye; in marked contrast to his second, who boasted of but a bad frontispiece, and was altogether only a narrow light one, with not much promise of going on. Still crescendo, the yearlings were a capital class, Mr. George Turner's trio being, however, unfortunately disfigured by an obstinate ring-worm that has broken out in his herd. The three selected were all good samples of the Devon—Mr. Bodley's lengthy and level; Mr. Perkins', though bred in Somersetshire, very bloodlike; and the Dorset, if not of quite so high a character as either of the others, very neat and taking in his appearance. The judges generally commended the cow class, and especially distinguished three from amongst these, of the herd that Lord Portman was in such a hurry to get out of, after he had only laid so good a foundation for its success. These honours, on something of the *vos non vobis* principle, are now transferred to Mr. J. A. Smith, of Bradford Peverell, who took the first prize with a very sweet fresh cow, and matched her with two others, both of which were deservedly noticed in the return. Mr. Farthing's Cheerful was rather out of date by the side of these blooming beauties; but she is a grand old cow still, and with a calf at her side also claims the second prize yearling bull as her son. Piccolomini, at a year older, is wearing well after all her travels by land and by water, and either for mere numbers or real merit the cows had the call of the Devon classes. There were only three heifers in-calf shown, but the three prizes were very properly distributed amongst them: Mr. Hambro's, however, being far away first, as very handsome and useful, and especially commendable for her rare back and quarters. Mr. Turner's second was a heifer of high quality and fashionable appearance, and the third, if

of "another sort," level and sizeable, but not quite right in her fore-quarters. The thorough-breds had it all their own way with the juveniles; but *Devoniensis* is terribly *petite*, and can never be anything more than a gem in the family casket, while Young Crafty has growth and depth, and Mr. Buller's best a high character to sustain hereafter. She would pair well with Mr. Newbery's young bull, and the two went far to save the credit of the Devon breeders at their own show. It is not for us to give the reason why, but of late these gentlemen have evinced some inclination to turn their backs upon the Bath Society even when it travels right down to the far West. With more showing, the Herefords, that made so signal a stand at Wells, were anything but at home in Exeter, and nine animals were sent to compete for sixteen prizes. Mr. Duckham, who had entered two, was unable to ascertain whether his bull was qualified in accordance with the conditions of the Society, and as a consequence sent neither. There was "no entry" for old bulls, and Tambarine, a deal too big, and, of course, at some sacrifice of his fine character, had a walk over in the next class; Battersea, who has trained off a bit since we left him at Hereford, having no difficulty in beating Mr. Taylor's other bull, whose back was as hard as a board, for the choice of the two two-year-olds. The one cow in her class, handsome and cheerful to look on, showed more of the cow attributes in her sweet head and fine neck than some of this sort can lay claim to; but the single heifer in-milk scarcely merited the secondary consideration allowed her by the judges. Her joint owners, however, righted in the next division, where the Messrs. James had a yearling that for shape, make, style, and quality would have stood out against Battersea himself as the best of the breed. She is a very sweet heifer, and the class, that with an entry of four, really ran into something like competition, altogether a good one. The second, a lengthy growing damsel, with a wonderfully fine fore-quarter, spoke well for the late Lord Berwick's judgment, from whose herd she is bred on both sides. Mr. Taylor, however, was the only exhibitor in actual competition from the home county, where this lukewarmness should be looked to. It is not politic for the supporters of one of our established breeds to suffer this to be so poorly represented as the Hereford was at Exeter.

The Shorthorn, on the contrary, is still spreading, and there were more Shorthorns sent than of all the other breeds put together, Alderneys and extras included. Indeed the show of the sort was too strong for the judges, who went so palpably wrong in one or two instances as to create continual discussion over their awards. Mr. Druce at the last moment was unable to keep his appointment, and a Mr. Gray, of Kingsweston, was elected to assist Mr. Bartholomew, who had come down from Lincolnshire. Over the old bulls they had not much trouble, as these were at best but a rough lot, with two or three very coarse animals amongst them. Then the Knight of Lagan, that Mr. Stratton imported from Ireland, is not a show bull at the best of times, though highly bred, and with a deal of good about him; and he had to bow to an immense white animal, very well got up, as broad as

a waggon, and as long as a ship. This was something of a pull to the neighbourhood if not to the neighbours, as Snowball is the property of Sir Lawrence Palk, who would so appear to be setting up the Durhams in direct opposition to the Devons even on their own ground—a piece of temerity that would have sounded very like high treason about Barton a few years since. The next division, of three-year-olds, that is, was also very easily weeded, as five of the seven were wofully indifferent, and a Booth bull, sent all the way from Branches, the worst of the lot. It is rarely that so wretched an animal has been seen on a show-ground. Of the two left in, one was a very true-made young bull, with a very perfect head, masculine, but not coarse; capital back and quarters; thighs famously let down to his hocks; deep and level; of excellent quality, and with a beautiful coat. In fact, it was difficult to pick a hole in Windsor Castle, though the judges declared that they found his superior in an upstanding animal of some nine months older, of fairish quality and with good ragged hips, but only the better of the two, on the simple showing that he stood higher from the ground. Mr. Bartholomew and his friend went almost as dead wrong again with the two-year-olds, where they preferred Cirencester Duke to Royal Counsellor, the previous awards, when the two met at Banbury and Birmingham, having been just the other way. Counsellor, the champion bull of Oxfordshire, is a deep, heavy-fleshed animal, very true all over; whereas Grand Duke has his weak places, especially behind the shoulder; and there is little question but that this new reading will be corrected on the first opportunity. The third prize bull here was beaten at Truro by Pan, but the latter has gone all to pieces, and one look, as you stand behind him, will always be sufficient to condemn another sad example of the overdone system. Of Mr. Hewer's two, the judges highly commended the wrong bull, beginning, as he did, with an unpardonable head and horn; and it would need a deal of Oulshaw's eloquence to make one take to so thoroughly vulgar a beast as the Dumbleton Butterfly. It will be seen that the Shorthorn bulls at Exeter were not of a very high character, with the exception only of Windsor Castle and Counsellor, to whose manifest merits, however, the official return does not speak. The cows and heifers were far better, leading off, as the matrons did, with Pride of Southwicke and Maid of Athens. The former, who never looked better, promises well for Worcester, where she may even improve on her previous place at the Royal; but the white cow has got a little gaudy behind—always her worst point; and though she also goes on, we do not expect to see her again with anything like her pre-eminence at Wells and Battersea. The third to these proved good cows was scarcely after Mr. Stratton's show standard, and we believe she only took the place of another that was down calving. It is only right to say that the judges got on far more pleasantly amongst the ladies, while they finished up with two classes where it would have been difficult to go wrong, there were so many good, and so few bad. They deservedly commended the eighteen yearlings, amongst which Lady Pigot and Mr. Stratton were conspicuous, though neither quite reaching to the front. Such

show of Shorthorn cows and heifers would have told even in Yorkshire, and in Devonshire it should certainly not be without a moral. If not yet quite able to make much of a fight against such herds as those of Lady Pigot, Mr. Langstone, Mr. Stratton, and Mr. Lane, the Cornishmen are still closing in on one side, as Oxfordshire, Wiltshire, and Somersetshire on the other. In a word, it is impossible to read the Exeter Cattle Show of 'Sixty-three without feeling that the Devonians have not come out in that force they should have done, even with Worcester in the distance. The extra stock included some very superior Guernsey and Alderney cows, one of which, with her three strapping calves at her side, commanded a deal of attention. Mr. Rendle imports the Guernseys; but Mrs. Maberley's Alderneys were very sweet and pretty, if not similarly distinguished; and Lady Pigot had a Stackhouse cow in this outside division, that, so far as good looks and nice quality go, might have very fairly held her own in more direct competition.

The Leicesters had the same lead amongst the sheep as the Shorthorns with the cattle, their great rivals the Southdowns showing here in no great force, the very prize animals being nothing beyond plain useful rams, and the pens of ewes terribly lacking that elegant high-bred character so observable in the late Sir Robert Throckmorton's entries at the West of England meetings. The few other Downs were noticeable only for a capital pen of useful square Hampshire, exhibited by Mr. Shittler, and that deservedly took the first premium of their order, although with no competition. Mr. Moore's yearling rams were again distinguishable by their coarse heads, lop ears, and bad necks; while the class of other Down rams of any age ended in "no race." The Somerset and Dorset horned sheep furnished three small but very even classes, with Mr. Danger, Mr. Paull, and Mr. Bond dividing the honours amongst them; but Sir Thomas Acland's mountain sheep were paunchy, badly-framed animals, and the Dartmoors, running to another three entries, as little remarkable for merits as numbers. The separate class for Cotswolds has already been abandoned, but Mr. Handy had a true grown sheep with a rare back as the first "other" long-wool ram of any age; and Mr. Gillett, whose Wells prize sheep was beaten by the one we have just named, a smart stylish yearling. The two pens of ewes, however, were scarcely worthy of the premiums considerably allotted them; and some of the other long-wools, as with Mr. Partridge's, would appear occasionally to do duty as Leicesters. With just such an exception or so, these thirty-five Leicester yearlings made up a capital class, with plenty of size and fine quality. The judges over the Leicesters had indeed a very trying time of it, and were arguing and debating and drawing them long after their fellows had finished. Their first was ultimately proclaimed to be a compact, good-ribbed, capital-necked, Cornish sheep, while they went into Somersetshire for a second, where, we believe, Mr. Corner has been using some of Mr. Tremain's rams; so that the two prize sheep may be something of the same sort. But the best Leicester was Mr. Turner's first prize old ram, a remarkably handsome high-bred animal, showing all over the true type of his breed,

and with a head that alone spoke to the purity of his descent. His second was coarser, and not in such good form, while a wonderful five years old ram of Mr. Potter's was highly commended, as he deserved to be, as a wonder for his age; a son of his, the property of Mr. Buller, who has been using the old Yellowford sheep, being commended in the same class. Mr. Corner's prize ewes were an even sorty pen, though for our own part we should have stood to Mr. Turner's as better bred, if perhaps a little delicate, the only point that could have stood in their way, and that on a division went against them. Mr. Norris sent two lots of great useful sheep, but for the *one* best ewe we should unquestionably have gone to the Beacon Down pen, a yearling that with something to match her may find more favour further on.

In carrying out their endeavour to improve the breed of horses by supplying the country with better sires, the Council have adopted the plan pursued in Northamptonshire, and by some other more local meetings. That is to say, the show of stallions takes place early in the spring, and the winning horses as a consequence start upon their several circuits with the official recommendation of the Society at their backs. There is a deal of practical service in such a system, though still not without its drawbacks, as none but the prize animals are required to make a second appearance at the great summer gathering, and hence the effect of the two chief classes is destroyed. As we announced at the time, Ratan and the Bald-faced Stag were selected as the first and second thoroughbred ones best calculated to get hunters and hacks, and Mr. King's The Model, and Mr. Horswell's Stapleton, as the choice of the companion entry for agricultural purposes. At two-and-twenty years old, and after a very heavy season, Ratan is certainly a wonderful horse, of good size and symmetry, at the same time very bloodlike, and looking fresh enough to wear for another ten or twelve seasons. Much as the award was canvassed on its being first announced, the judges have something now even beyond the fine old chestnut's appearance to go on, as there were some very clever yearlings by him on the ground. The entry, in fact, was in this respect considerably in advance of what the West of England has hitherto been able to command in the way of riding horses. The first prize colt, however, and far away the first, was a thoroughbred one, not by Ratan, but by Sir Lydston Newman's famous horse Gemma di Vergy, and one in every way worthy of his sire. With bone, substance, quality, and action, we should only fear that Barumite would be considered too good for hunting purposes, and that he will have to try his fortunes in another sphere. Mr. Turpin's mealy chestnut filly by Ratan was very good all over in everything but her colour, and a colt and filly, both by Ratan, and both the property of Mr. Watson, of Dorsey, were also commendable for their high character and promise, though the judges declared that they found something better than either—a return that should of itself be sufficient to put some stamp upon the Exeter show of yearlings. The four-year-old class proved a failure, from Mr. Wollocombe not having nominated his horses in time, or otherwise he had a very stylish Vulcan horse, which, with two others, were, from

this neglect on the part of their owner, shelved amongst extra stock. Mr. Elliott's cob, a good strong Bishop's black, was also disqualified from being over height; and the veterinary inspector rejected Mr. Adney's yet more clever little Vampire, a hunter in miniature, and with a heart still good enough to wear out many a big'un. The brood mares in this section were one more a very incongruous company, although the first prize is a fine alashing hunter, with a better combination of blood and power than we fancy they often see in Devonshire. The ponies, with the exception of the two prize stallions—both substantial little castles—were inferior, and Sir Thomas Acland's Exmoors sorry weeds with what an improved Exmoor now should be. One of the cleverest of these again was in uttermost regions, a high-bred varmint little lady from Bideford, that has been earning a certain local reputation as "The Queen of the West." The Exeter show of riding-horses was altogether encouraging, and in good earnest of what the Society may still do in this way. Of the agricultural horses it is not possible to report so favourably. The entries were very short, and as a rule very moderate. The roan stallion The Model, however, is a compact, round-bodied, active animal, with weight and action as the two chief recommendations of a cart-horse. The Clydesdale was by no means so good, and the judges only took to him as the best of a bad remainder. Mr. Hitchcock's mare will match with her sister that won at Wells last year; but the half-dozen entries of young "carters" were all indifferent. According to the return, this same Mr. Hitchcock acted as one of the judges of agricultural horses, and returned thanks at the dinner in that capacity; an appointment that reads rather curiously with his also taking a premium in one of the classes he officiated over!

There was no more complete section of the show than that which was devoted to the exhibition of large and small pigs. The latter were particularly good, and, as will be seen, the judges were very liberal in their commendations. The blacks are the favourites in these parts, with the Improved Essex improved again into something more sizeable, though Sir Massey Lopes, Mr. Turner, and Mr. Partridge still keep them as neat as imported from Botted. Mr. Wainman's whites, good as they were, looked quite out of place here, the larger breeds running almost entirely on the Berkshires, with which Mr. Hewer was in all his wonted strength. In the first class of large aged boars there was rather noticeably no competition, so that Lord of the Wassail, who came all the way out of Yorkshire, had the comparatively barren honour of a walk over; while in competition Mr. Wainman had to succumb to the blacks and mixtures. In truth, the Carhead piggery was never more highly tried, and it is some evidence of the excellence of the entry to find such famous hogs beaten on their merits. Let us add that the judges recorded the poultry show to be a capital one, so that the ever ready dish of eggs-and-bacon would rank well with the more substantial round or ambitious haunch.

The trial of field implements took place at Topsham, about four miles from Exeter. Along the head of the fields chosen ran the South Western Railway, so that nothing

had to be done for the convenience of visitors but to improvise a station. For those who desired to go by the road there were cabs, and for the multitude at 6d. a-head from the show-yard there was Aveling and Porter's locomotive which steamed away in grand style, but proved in the narrow Devonshire lanes a considerable difficulty—in the way either of those who were met by it, or those who desired to pass it. In spite of the distance, in spite of the wind and rain, in spite of what may be called Bath and West of England weather, crowds of people were occasionally upon the ground during the proceedings. Nothing seemed to daunt them, at least upon the Wednesday, whereas on the day previous the attendance was very thin. The steam cultivators and ploughs were the great attraction, and judging by the remarks made, the large majority of those who attended had never seen such things before. A deal of attention was directed to a huge steam roller, one of the most original inventions of the implement department. The design traces many years back to one Heathcote, but is now revived, with probably some modifications, by Mr. Blackburn of Exeter. He makes one large cylinder take the place of two ordinary drivers. Inside this cylinder, 8 ft. wide, is placed the boiler, which being mounted on small wheels travelling on rails fitted on the inner periphery of the cylinder, is thus kept horizontal while the huge envelope revolves. The steam cylinders are placed on a strong wrought-iron frame work in advance of the large travelling wheel, and on the platform thus made the driver is seated. The chimney is branched; it springs from each end of the boiler, and meets above the cylinder. Cricket players would deem it an excellent device to keep their ground level.

The fields selected consisted of one ploughed field to test the harrows, where Ashby's revolving implement made some capital work; a small field of rye for the reapers, and two pieces of respectable grass layer to be broken up by the steam and the horse ploughs. Of this space each of the three steamists, Fowler, Howard, and Cambridge (Smith's), had 4 or 5 acres allotted to them, which they endeavoured to play with for two days. Fowler first put on his ploughs and then his cultivator with the usual effect. The ground was so light that it was considered that the cultivator would not show to advantage; though it performed to admiration. Howard's cultivator also made good work, but the chief point of interest lay in the new plough. Necessity is here again the mother of invention. The principle of a balance was denied them, and they have consequently found refuge in something which is not a balance in the sense of specifications of patents held by Fowler. The frame work and the three wheels of the international plough are retained; the difference is that the frames which hold the opposing sets of ploughs are perfectly independent of each other. They are not balanced the one by the other, but, instead, they are balanced by two pairs of springs above them. These springs, encased in little boxes, are just sufficient in power to hold the idle set of ploughs out of work, and when these are required in their turn the springs are released. The implement performed very favourably, turning over three furrow slices with beautiful regularity—so

regularly in fact that one could not discern any series of triplets, so common in three furrow work. There was some little disposition on the part of the plough to fight shy of hard land; but it can hardly be stated that this was from want of weight, for it might be due to an accident which occurred as the implement was leaving the yard. It got way down hill, turned over a cab, and did a considerable amount of mischief; receiving in return more than could be amended before the hour appointed for its appearance in the field. Mr. Smith's tackle performed capitally under Mr. Cambridge's manipulation, and there are no changes here that require notice.

There were a good many competitors at work in the rye crop, which stood fully six feet high, but was level and clear. Samuelson tried his ingenious self-raker—too well-known now to need description—but the rye was over long for the rake which sweeps the platform. They could neither get rid of it readily, nor lay it well. The pretty little manual delivery machine exhibited by this firm is well worthy of notice; fitted up with tipping platform to assist the man with the rake. Wood's well-known American machine was exhibited by Cranston, and the other reapers employed were sent by Pickaley and Sims, Cuthbert, and Barrow and Page, a Devonshire firm. Wood's would have done better than it did had the back-delivery been adhered to, but the crops were too long for the reel; whilst the back-delivery operation in all the cases in which it was adopted appeared to be very popular. There seems to be already some reaction upon the strong opinion formerly expressed in favour of continuous side or swarth delivery, and the public were delighted with the success attained by all the exhibitors, but especially so in the case of Pickaley & Sims, Cuthbert, and Samuelson.

In horse ploughing, there was no work to touch that made by the Messrs. Howards' V. V., which cut a high-curved furrow slice with a splendid harrow edge, and combined all the excellence of the Scotch work without its defects. Mr. Buckingham made good work with a one-way hill-side plough. Messrs. Hancock created considerable sensation with their capital pulverizing plough, another novelty in this district. It was used with two shares, the first of which skimmed the top to the depth of about one inch, while the second share, working from five to six inches deeper, placed the second edition on the top of the first. The green top is thus effectually buried, and a shattered seed-bed at once produced. Chamberlain, of Dodbrook, Kingsbridge, showed a turnwrist plough, with which he pared off the grass to a depth of two inches, and then returning on the same furrow laid the remainder of the slice exactly upon it. Hole of Kenton, and Eddy of Kennford, were also exhibitors. The latter brought to trial a two-wheel iron plough, with a turn-furrow appliance so constructed as to cut the slice precisely square. The work was exceedingly good, and surpassed only by Howard's; while James Wright of Sandford, and George Hole of Kenton, made fair work. It is said that some official report is to be issued over these trials, or rather exhibitions, of field implements; but they were on so small a scale, that very little can be said about them. In the yard, engines and thrashing machines were running in the space

devoted to machinery in motion the greater part of the week, and in something of this order—Aveling and Porter; Pickaley and Sims; Tasker; Tuxford; Clayton and Shuttleworth; Barrett, Exall, and Andrewes; Turner; Hinckley; Hornsby; Barrows; Humphreys; G. Parsons; Garrett; Brown and May; and Gibbons. With an utter absence, as usual, of any direct incentive to improvement, or authorized test from trial, there was but little rumour of novelty in the implement avenues, the composition of which will be gathered from the subjoined synopsis of each stand on the show-ground.

AVELING AND PORTER, Rochester.—Nine and ten-inch cylinder patent locomotive engines for agricultural purposes, with patent steerges.

PICKALEY, SIMS, AND CO., Leigh, Manchester.—Chaff-cutting machine, for cutting two lengths without change of wheel, steel grinding mill, patent cone pulper, Hardley's grinding mill, and four horse power bone mill, with sieve; a large variety of chaff-cutters for hand and steam power, steel grinding and oilcake mills, single and double-action turnip cutters, and patent cone pulpers, two horse power bone mill, with sieve, six horse power portable steam engine, American horse rakes, land and garden rollers, patent reaping machines for one and two horses, four horse power combined thrashing and shaking machine, with horse works complete, hay and manure forks; also an assortment of garden furniture.

TUXFORD AND SONS, Boston.—Eight horse portable double cylinder portable steam engine, with vertical cylinders and improved boiler, patent combined thrashing machine for finishing in one operation for market, and newly patented straw elevators.

TASKER AND SONS, Andover.—Four horse power portable steam engine, and patent combined single blower thrashing machine, fitted with patent corn elevator: drills for corn, seed, and manure, combined; iron one and two wheel ploughs, sets of three and four beam patent trussed frame iron drags and barrows, steel toothed iron lever horse rake, winnowing machine, patent corn elevators, and iron mould and gravel screen.

CLAYTON, SHUTTLEWORTH, AND CO., Lincoln.—Ten, eight, and five horse power patent double and single cylinder portable steam engine, combined portable treble and double blast finishing thrashing machines, and improved portable straw elevators.

BARRETT, EXALL, AND ANDREWES, Reading.—Portable steam engine and 42-inch portable combined thrashing machine, fitted with patent corn elevators, four horse power horizontal fixture steam engine, two horse power patent portable thrashing machine and horse gear, and steel-toothed patent lever horse rakes.

TURNER, BROS., Ipswich.—Four horse power portable steam engine and combined thrashing machine, with dressing apparatus to finish corn for market, and combined crushing or bruising mill, for oats, linseed, &c.; malt mills, stone grinding mill, oilcake breaker, and improved chaff cutters.

HINDLEY, Bourton.—Five horse power portable steam engine, patent combined thrashing machine, crushing mill, for quarts, coprolites, &c., hydraulic and double screw cider presses, improved apple mill, wrought-iron cider screw, and improved oilcake mill.

BLACKBURN, Exeter.—Traction engine and steam cultivator, adapted both for road and farm purposes.

HORNSBY AND SONS, Grantham.—Eight horse power patent portable steam engine, and improved patent portable combined thrashing and finishing machine, with new patent corn elevator attached, an assortment of improved patent iron ploughs, eight and ten row patent corn and seed drills, corn dressing machine, improved patent turnip cutters and root pulpers, a collection of patent improved washing, wringing, and mangling machines, and Indian rubber wringers.

BARROWS, Banbury.—Four and two horse power portable steam engines and combined thrashing and finishing machine,

BODLEY AND SONS, Exeter.—Two horse power portable steam engine on two wheels, portable thrashing and finishing machine, and machine for reed-making, horse and hand power apple grinding mills and rollers, cider press screws and nuts, models of cider presses, bean and oat crushing and grinding mill.

WRENFORD, Barnstaple.—Portable combined thrashing and finishing machine, reaping, hay-making, and winnowing machines.

BRADFORD, Manchester.—Patent steam or water power washing and combined washing and wringing machines, also new patent atmospheric dash washing machine, and 2½ horse power portable steam engine; a large assortment of patent washing, wringing, and mangling machines in separate and combined forms, two and three roller mangles, Indian rubber clothes wringers, improved churns, portable boiler, and new patent mineral or cereal separator or cinder sifter.

HUMPHRIES, Pershore.—Six horse power portable steam engine, and patent combined thrashing and finishing machine.

DREW, Morchard Bishop.—Five horse power portable thrashing machine, winnowing and reaping machines.

PARSONS, Martock.—Eight horse power portable steam engine, improved portable double blast combined thrashing and dressing machine, and portable mill for steam, water, or other power, reversible wagonette, market cart, patent wheels and axles, and patent fire or garden pump.

GARRETT AND SON, Leiston.—Improved portable steam engine, patent combined treble blast thrashing and finishing and patent combined thrashing and rough dressing machines. Improved West of England and full-sized Suffolk lever corn and seed drills for hilly and flat lands, broadcast manure distributor and seed and manure drill, patent horse hoe, improved corn dressing and finishing machines.

BROWN AND MAY, Devizes.—Eight horse power agricultural locomotive engine, and 3½ horse power portable steam engine and combined thrashing machine.

GIBBONS, Wantage.—Four horse power portable steam engine and portable combined thrashing machine.

HAWKINS, Exeter.—Economic cooking apparatus, or stove.

SAMUELSON AND CO., Banbury.—Self-raking reaping and combined reaping and mowing machines, double-acting hay-making machine, double and single-acting turnip cutters, root pulping machine, improved chaff cutters, linseed cake breakers, chain harrows, and lawn mowing machines.

JAMES, Tivoli.—Prize liquid manure distributor, improved horse and liquid manure pumps, and washing, wringing, and mangling machine.

CARSON AND TOONE, Warminster.—An assortment of chaff cutting engines for steam, horse, or hand power; improved Moody's turnip cutters, wrought iron horse hoes, single and double cheese presses with double levers and pulleys, self-cleaning cross-cut field roller, iron field and garden rollers, three share grubber or scarifier, wrought iron general purpose plough, wood and iron sack trucks, and oil-cake crusher.

BAKER, Wimbech.—A collection of combined blowing, winnowing, and dressing machines.

BENTALL, Heybridge.—Horse hoe and ridging plough, patent light broadshare, three beam harrows, corn and seed crusher, bean kibbler, universal kibbling mill, an assortment of chaff cutters, root pulpers, and turnip cutters, for hand or horse power, oilcake mill and breaker, horse gears, thrashing machine, and oat mill.

WIGHTMAN AND DENING, Chard.—Haymaking machines, horse rakes, field roller, tubular field gate and posts, cheese presses, iron ploughs, horse hoe, corn and pulse crushers, and apple mill and corn bruiser, iron drags, harrows, also horse gear.

NOBBLINGTON AND CO., Plymouth.—Samples of manures for grass, cereal, and root crops, linseed cake, and cattle food, also vulcanized saddle girths.

CAMBRIDGE, Bristol.—Ten horse power portable steam engine, improved steam windlass, and set of tackle for steam cultivation, winnowing machine, washing wringing and mangling machines, double action press wheel rollers and

elod crushers, patent jointed self-expanding and dividing chain harrows, and improved horse rake.

HOWARD, Bedford.—Set of patent apparatus for cultivating land by steam power, patent double action three furrow steam plough, haymaking machine, horse rakes, improved expanding horse hoes, an assortment of single and double-breasted ploughs adapted for all soils and requirements, iron four beam, three beam, jointed, and drag harrows, tubular iron whippetrees, and iron plough shade.

BOWDEN, Hniah.—Collection of iron ploughs for general purposes and double moulding or drilling, three and two horse power cultivators, horse hoe, general purpose harrows, set of three beam drags, horse rakes, gas-pipe whippetrees, and cheese press.

GLIDDON, Williton.—Open-fire cooking ranges, and steaming apparatus.

CLAY, Wakefield.—Patent cultivators or eradicators, horse hoe, and chain harrow.

EATON AND SON, Thrapston.—Combined turnip thinners and horse hoes, circular sheep cribs, rack bar lifting and engine screw jack.

MARSHALL, Exeter.—Two horse waggon, one horse and light chaise cart.

BOWDEN, Chagford.—General purpose and double moulding ploughs, three and two horse power cultivators, serpentine and general purpose harrows, and horse rakes.

HEARD, Crediton.—Small-occupation corn and combined turnip and mangold drills, broadcast manure distributor, flour dressing machine, and machine for thrashing and combing reeds.

BOBY, Bury St. Edmonds.—Double action haymaking machines, combined corn screening and dressing machine, a collection of single and double action ditto, also patent sample screen for office use.

PAGE & CO., Bedford.—Draining pipe and tile machines, collection of ploughs for light, medium, and heavy lands, double breasted or moulding ploughs, one and two wheel steerage horse hoes, five, seven, and nine tine lever scufflers, improved chaff cutting machines for horse or hand power, linseed cake mill, sets of diagonal iron harrows, oval toothed horse rakes, sets of wood whippetrees and bench drilling machine.

MILFORD, Kent.—Light two horse farm and road waggon, farm and road carts, and improved cart wheels and axles.

FRY Brothers, Bristol.—American sash and steel-toothed horse rakes, grass mowing machines and grass seed distributor, one row seed and manure drill, sheep rack, sets of chain harrows, light farm chaise and water carts, and winnowers.

WOOD, London.—Wood's two and one-horse mowers, also reaping machine.

BURROW & PAGE, Morchard Bishop.—Light two-horse reaping machines, double and single action haymaking machines, improved winnowing machine, chaff cutting, one horse reaping, also reed-making machines; American horse rakes, corn crusher, and combined reaping and mowing machine.

HAWKES, Tiverton.—Four-row manure and seed drill, improved haymaking and chaffcutting machines, combined thrashing and reed-making machines, light iron general purpose and turnwrest ploughs, horse hoe, sets of chain harrows, rick boring and weighing machine, hay and other forks, hay and corn collector, samples of manures, articles used by millers, and West of England sals.

EDDY, Kenford.—Light general purpose, and heavy land iron ploughs, iron turnwrest, subsoil, and ridge ploughs, iron horse hoe, corn seed and manure drills, iron lifting jack, chain harrow, horse-rake, iron rotary lifting machine, three and four beam iron drags, compound lever cheese press, sets of light and general purpose iron harrows, iron sheep rack, wrought iron scarifier, and horse hoe.

HOLMES & SON, Norwich.—Improved circular saw table, ditto seven feet and twelve row corn and seed drills, corn and seed broadcast sowing machine, small occupation corn seed and manure drill and distributor, economical seed and manure drill for ridge and flat, general purpose horse hoe, single row hand drill and corn dressing machines.

REYNOLDS BROTHERS, Breton.—Four, three, and two row

Withine manure and seed drills, eleven and seven row corn drills, four row liquid manure drill, manure distributors, horse hoe drill, single row horse hoe, guano breaker, wrought iron portable pump, and weeding paddler or thistle destroyers.

RICHMOND & CHANDLER, Salford.—A collection of chaff-cutters, bean and oat mills, corn crusher, two horse driving gear, steaming apparatus, sackholder, root washer, and kneading machines.

BRANK, Newton Abbot.—Four, three, and two horse power portable threshing machines, three row turnip and mangold drills, Bentall's chaffcutters and winnowing machine.

MILFORD, Throverton.—Improved two horse waggons and one horse carts, farm, sporting, and spring market ditto.

WRIGHT, Sandford.—Iron ploughs for light, medium, and heavy lands, turnwrest ditto, haymaking and reaping machines, horse rakes, four beam light and heavy drags, sets of three-four beam harrows for heavy and light soils, set of chain harrows, improved horse hoe, five prong cultivator, and iron sheep rack.

JOHNSON & WHITAKER.—An assortment of chaff cutting, root pulping, stripping, and slicing machines, oilcake breaker and mill, wringing and mangling machines, lawn mowing machines, gorse machine, and garden rollers.

ARCHER, Islington Green.—Improved washing, wringing, and mangling machines, and other articles for domestic use.

BULLED, Witheridge.—Light three, two, and one horse waggons, and Huxtable's hay machine.

HILL & SMITH, Bricley Hill.—Wrought iron economical and other field gates, ornamental entrance gates, continuous sheep, deer, and cattle fencing, flat and round bar, also ornamental game proof hurdles, continuous or fencing, winding straining pillar and stag, set of tools for erecting wire fences, iron garden wheelbarrow, samples of gameproof netting, iron heating barrow, wrought iron tree guards, vermin proof rick stand, and patent black varnish.

COLMAN & SONS, Chelmsford.—Five and seven line cultivators for light and heavy work, and potato digger.

MILFORD & SON, Throverton, Leeds.—One-horse and other farm and market carts, two-horse waggons and improved lifting jacks.

WALCOT, Islington.—Scythe chaff cutting, hay and straw knife, and scythe sharpeners.

WRIGHT, Sandford.—A collection of ploughs for heavy and light lands, Serpentine drags and harrows, horse hoes and rakes.

DODGE, London.—Samples of vulcanised India-rubber machine bands, ditto garden and fire engine hose, ditto double texture waterproof covers, rubber washers, packing and gaskets and drill tubing.

NORRINGTON, Exeter.—Oil cake crushers, chaff cutters for hand or other power, oat, bean, and roller mills, oat and bean crushers, turnip cutters and pulpers, cheese presses, cultivators, root and corn drills, manure distributor, sets of iron ploughs, haymaking machines, sets of drags and harrows, rotary sifting machine, American horse rakes, iron whiplashes and stretchers, iron sheep racks, corn screens and dressing machines, weighing and reaping machines, combined washing and mangling machines, hayforks, lifting jacks, and reversed drawing machine.

WOODS & COCKSLEDGE, Stowmarket.—Corn grinding and crushing mills, iron horse power, double action turnip cutter, patent weed extirpator.

ARNOLD & ARNOLD, Plymouth.—A large assortment of articles for farm, garden, and domestic use.

ASHBY & CO., Stamford.—Double action haymaking machines, steel and iron tooth horse rakes, wheel hand rake, chaff cutters for hand and power, oil cake breaker and mill, and sets of rotating harrows.

FOWLER JNO., London.—Steam cultivating machines, and four and three furrow balance ploughs and cultivators.

LYON, London.—Machine for pulping steamed roots, a collection of machines for mincing and cutting meat, fish, or vegetables, and other articles of a similar kind for domestic use.

CHAMBERLAIN, Dodbrooke.—Compound spade, one way and light double ploughs and cultivator.

PARKIN, Exeter.—Improved cider press, collection of cider screws and nuts, apple breakers, ornamental garden chairs, circular an straight pig troughs, combined winnowing machine, cobble stones, cheese press, and sets of cart axle boxes and nave stocks.

POLYBLANK, Newton Abbot.—Five horse power combined threshing and finishing machine, strong five horse power, and wrought-iron cider screw.

WHITMAN & Co., London.—An assortment of chaff cutting machines, bean mills, oat, linseed, and corn crushers, locust bean and kernel mills, steeled corn grinding and oil cake mills, stone corn also flour mills, flour dressing machines, and patent sausage machine.

LUXTON, Hatherleigh.—Reaping machine, corn drill, turnip and manure drill, winnowing machine, hay turner, horse rakes, thrashing and winnowing machine, cultivator, banking plough, horse hoe, and zigzag harrows.

SUMMERSCALES AND SON, Keighley.—Patent combined washing, wringing, and mangling machines, and lawn-mowing machine.

WEIR, London.—Irrigating and liquid manure pump, draining levels, Prussian spring balances, combined washing machines, patent box churns, set of dairy utensils, and other articles for domestic use.

HOLE, Kenton.—Iron ploughs for medium and heavy work, and horse hoe with moveable frames.

CUTHBERT AND CO., Newton-le-Willows.—One or two-horse improved Hussey's reaping machine.

WEBBER, Newton Abbott.—Combined thrashing and winnowing, also reed-making, machines, and hay-making machines.

FINNING, Shobrooke.—Two-horse waggon with lades.

STEPHENSON, BROTHERS, Plymouth.—Improved corn crushers, chaff-cutting machines for hand or power, turnip cutters, noiseless mowing machines, engine, syringe, and pails for garden use, weighing machines, pig and poultry troughs, corn measures, cast-iron lift and liquid manure pumps, cast-steel hay, pitching, and digging forks, wire netting, and other articles for barn, farm, and garden use.

HUXHAMS AND BROWN, Exeter.—Banner mill stone-slayer, or bedstone ditto, patent steam boiler, and differential pulleys.

MAUNDER, Ottery St. Mary.—Eleven-coulter corn drill, hay-making machines, and horse rake.

WESTERN COUNTIES AND GENERAL MANURE CO., Torpoint.—Samples of superphosphate and ammoniacal manures.

RADCLIFFE, BROTHERS, Peaslebury.—A collection of patent chaff-cutting machines, ditto combined wringing and mangling machines.

DICKER, BROTHERS, Chagford.—Four-horse power thrashing, and combined reaping and mowing machines, root pulpers, and chaff-cutting machine.

HOGG, Upton Pyne.—Portable reaping, reed, thrashing, and combing, also hay-making, corn dressing, and heaving machines, and wheat, turnip, and mangold drills.

SEAMAN AND TIPPING.—Sets of excelsior harrows, and excelsior ploughs.

TRIMBLETT, Silvertown.—Two-wheel iron ploughs, 4-beam iron drag, and iron harrows, horse hoes, horse rake, chain harrow, sheep rack, and chaff-cutter.

BRIDGES, London.—Butter prints and other dairy implements.

JOHNSTON, London.—Butter churns of various sizes, patent mangle, cloth presses and butter knives, and beaters.

BUCKINGHAM, Bathpool.—Turnshare improved double and one way ploughs, general purpose and light cultivators.

ROBERTS, Bridgwater.—Whitechapel dog cart.

SMITH, BROTHERS, Thrapston.—Patent hay-maker and horse rake.

WARREN, Maiden Newton.—Winnowing machines and hay machine.

BAMLETT, Ripon.—Mowing and reaping machines, also combined mower and reaper.

BICKFORD, Exeter.—Irrigation gutter plough for horses.
CURSON AND SONS, South Zeal.—Turnip-seed and manure drill, and turnip cutter.

VANSTONE, Buckland Filleigh.—Two-horse paring plough, steam power chaff-cutter, West of England seed and manure drill, single drill for turnips, and reed making machine.

MOORE, London.—Scythe, table-knife, and scissors sharpeners, sets of water-gauge fittings, steam-cocks, and steam-boiler gauge glasses.

HARWOOD & Co., Hornsey Road.—Patent clothes wringer, cottage knife cleaner, and knife, scythe, and scissors sharpeners.

FRITH, London.—Cottage knife cleaner, magnetic hammer, and knife, scythe, and scissors sharpeners.

TURNER, Brompton.—Sausage-making machines, American coffee mills, and other articles for domestic use.

ATSHFORD, London.—Farmers' and tradesmen's carts.

CHILDS & Co., London.—American sawing machine, also clothes wringer.

PEARSE, Exeter.—A large collection of articles adapted for farm, garden, dairy, and general household use.

HUGHES & SON, London.—An assortment of French mill-stones, flour-dressing and smut machines, metal prover, and other mill-stone maker's implements; leather mill bands, corn and flour measures, and assortment of sack barrows.

WILLIAMSON, London.—Washing machines, in combined and separate forms.

BROWN, BROTHERS, Lyme Regis.—Cooking apparatus of various kinds, and minor articles for domestic use.

NICHOLSON, Newark-on-Trent.—Double and single action haymaking machines, tubular shafted iron horse rakes, with seats for driver, oilcake breaking machines, sack raiser, and patent garden roller.

GARTON & KING, Exeter.—A large assortment of cooking and hall stoves, stable fittings, garden utensils, weighing and washing machines, wrought-iron registered oval, crescent, segment, kettle-drum, and cylinder boilers and fittings; wire and cattle fencing, and a miscellaneous collection of articles for garden, farm, and domestic use.

BAKER, Compton.—New improved liquid manure cart.

HOUSE, Market Lavington.—Improved crushing mills.

LEE & Co., Leicester.—Oscillating harrows, subsoil looseners, gas pipe, and general-purpose ploughs, horse rake, and improved haymaker.

GOUCHER, Worksop.—Sets of patent beater plates (drum and concave) for thrashing machines, patent drum ends, and model of patent drum of thrashing machine.

WALLIS, HASLAM, & STEVENS, Basingstoke.—One and two wheel iron ploughs, plough presser, and four and three beam excelsior and chain harrows, wrought-iron horse hoe, combined washing machine, self-adjusting spherical bearings, and wood hanger for thrashing machine.

FREEMAN & HARDON, Manchester.—Samples of Royal patent cake, and economic food for cattle.

ROGERS & Co., Bristol.—Light Clifton waggonette.

HUTTABLE, Ottery St. Mary.—Haymaking machine, horse rake, winnowing machine, field roller, turnip and mangold drill, cheese press, bread making machine, and one-horse gear work.

BROWN & Co., London.—A collection of Shank's lawn-mowing machines, garden roller and harrow, iron hurdles, field gate, bar fencing, and garden furniture of various designs.

DEVONSHIRE MANURE COMPANY, Exeter.—Samples of manures.

NEIGHBOUR & SONS, London.—Improved cottage and other beehives, together with other articles used in the general management of bees.

SUTTON & SONS, Reading.—A large collection of agricultural seeds, ditto in glass cases but initially arranged, collection of grasses and seeds of grasses most useful for permanent pasture, collection of wheat, barley, and oats grown in Victoria, and models of the most approved kinds of turnips, mangold wurzels, carrots, and other agricultural roots.

KENSOLE, Heavitree.—Wood and glass conservatory.

MORTON & Co., Liverpool.—Galvanized iron roofing, straight and removable model of fire-proof granary, ditto of bailiff's cottage, shooting lodge, shed, &c.; winding straining pillars, oval iron standard, indestructible and other fencing; entrance, field, and wicket gates, and low fencing for ditch tops.

PARKHAM, Bath.—Iron field and ornamental gates, strained wire, galvanized and continuous fencing.

FESTER, Exmouth.—Samples of pure dissolved bones and other agricultural manures.

BROWN, J. A. & Co., London.—Manceur's patent scales, from 1 to 500 lbs., in use.

EASTON & SON, Exeter.—Grooved clod crushers or granite ring rollers of various diameters, and pair of granite apple rollers.

MAULE & SONS, Bristol.—Terra Cotta ornamental fountain.

HAWKES, Tiverton.—American hay mower, and boring and weighing machines.

HUNT, BROTHERS, Earls Colne (Norrington).—Machine for hulling clover and trefoil seed, and oilcake breaker.

The President of the year, the Marquis of Bath, said at the dinner, "it had never been his good fortune to be in Devonshire without its raining," and there were accordingly heavy storms or gusts of rain on the Monday during the time the judges were at work, winding up with a wet evening. Tuesday luckily did turn out a clear fine day, but there was heavy rain again on the Wednesday and Thursday, as we hear, also on the Friday. On the Thursday this was awkward enough, as, despite the laudable ambition of a gentleman who would appear to think and dream of nothing but shedding and tenting from one year's end to the other, the keenest of the company sat down in their hats and waterproofs to a sort of shower-bath banquet, the dispiriting effect of which no doubt told upon the subsequent addresses. There was, indeed, but one speech of any great moment, and that was delivered by Mr. Thomas Dyke Acland, in returning thanks for the Royal Agricultural Society of England. In doing so, Mr. Acland, as one of the council of the national society, appears to have hazarded some such statements and arguments as these: That the Royal Agricultural Society could not command such a show of implements as the West of England had at Exeter—that the leading manufacturers did not exhibit at the Royal shows, and that they had good reasons why—that it would be better if the exhibitors of stock came to regard these meetings as merely large fairs, or that prizes for stock had better be abolished—that no agricultural society can keep up any pure breed of stock—with sundry jeering allusions to practical men, and so forth. The most extraordinary fact, however, connected with this most extraordinary oration, is that it was not contradicted there and then, as it should have been. Let Mr. Acland take the last implement catalogue of the Royal Agricultural Society's meeting, or let him go and judge for himself at Worcester, whether the Royal cannot command as good an exhibition of implements as the West of England did at Exeter! He himself has made the comparison, and, as everybody must see, at his own cost. Then Mr. Acland affirms that the leading manufacturers do not exhibit at the Royal shows! In contradiction to this we beg to state that they *do exhibit*—that they not only exhibit but compete, and

that for one year only did they stand aloof, with very good reasons why for returning. But, on the other hand, does Mr. Acland know that some of the leading manufacturers, after getting everything their own way; do not exhibit with the West of England Society; or where were such firms as the Ransomes and Crosskills at this very Exeter show? Further, "no agricultural society can keep up a pure breed of stock," when, as every thinking man knows, there is no other means so conducive to such an end. And a great national exhibition is to sink simply into "a great fair," when it is the very influence of the premiums that has made the prices of our pure-bred stock! Seldom is it that we have seen anything so utterly wanting in proper temper or discretion as Mr. Thomas Acland's response for the Royal Agricultural Society of England. There is, indeed, a somewhat amusing eccentricity in a man standing up to run down an institution which he is for the nonce assumed to represent. This gentleman, however, is in reality more directly identified with the management of the West Country Society than, fortunately for us, he is with the National one; but if this be the career he is sketching forth for his own protégé, well might the members at the General Meeting on Thursday call out for the presence of a little more practical knowledge and ballast on the direction of a hitherto influential agricultural association. As it is, the whole business is fast verging into an amateur *dilettanti* affair, the covert aim of which, if not to shelve the farmer outright, is to keep him in the back-ground. The conviction is only the more and more forced upon us, and we seriously advise the men of the West to look back to the past career of some of those who now again arrogate to themselves the control of the rural interest.

PRIZES FOR CATTLE.

DEVONA.

JUDGES.—J. Buckley, Normanton, Loughborough.
J. Quartley, Molland, South Molton.

Bulls above three years.

First prize of £12 to W. Treffry, Penheakes, Grampond (Sir Colin).
Second of £5 to Walter Farthing, Stowey Court, Bridgwater (Viscount).

Bulls not exceeding three years.

First prize of £15 to S. P. Newberry, Scrul Barton, Henslow (Prince Jerome).
Second of £8 to J. A. Smith, Wentworth Buller, M.P., Downes, Crediton.

Bulls not exceeding two years.

First prize of £15 to J. Bodley, Stockley Pomeroy, Crediton (Corcoran).
Second of £8 to C. F. Perkins, The Grange, Kingston, Taunton (Corporal).
Third of £5 to J. A. Smith, Bradford Peverell, Dorchester (Constitution).

Cows in calf or in milk.

First prize of £12 to J. A. Smith, Bradford Peverell (Young Hebe).
Second of £6 to Walter Farthing, Stowey Court (Cheerful).
Third of £3 to J. A. Smith, Bradford Peverell (Princess).
Highly commended.—G. Turner, Beacon, Downes, Exeter (Frodoomins), J. A. Smith, Bradford Peverell (Young Gold-cup).

The class commended.

Heifers in calf or in milk, not exceeding three years.
First prize of £12 to C. Hambro, Milton Abbey, Blandford (Lina).

Second of £6 to G. Turner, Beacon, Downes (May Flower).
Third of £3 to C. F. Perkins, The Grange (Alice).

Heifers not exceeding two years.

First prize of £6 to J. Wentworth Buller, M.P.
Second of £4 to G. Turner, Beacon, Downes (Devoniansis).
Third of £2 to J. Bodley, Stockley Pomeroy (Young Crafty).

SHORTHORNS.

JUDGES.—W. Bartholomew, Waddington Heath, Lincoln.
J. Gray, King-Weston, Somerset.

Bulls above three years.

First prize of £12 to Sir L. Falk, Bart, M.P., Haldon House, Exeter (Snow Ball).
Second of £5 to R. Stratton, Walls Court, Stapleton, Bristol (Knight of the Lagan).
Commended.—G. F. W. Miles, Forde Abbey, Chard (Oxford Prince).

Bulls not exceeding three years.

First prize of £15 to Messrs. J. Edgcombe and J. Staanes, Tavistock (Young General).
Second of £8 to R. Stratton (Windsor Castle).

Bulls not exceeding two years.

First prize of £15 to J. Lane, Barton Mills, Cirencester (Cirencester Grand Duke).
Second of £8 to J. H. Langton, M.P., Saraden House, Chip-ping Norton (Royal Counsellor).
Third of £5 to S. Widdicombe, Hay, Ugborough, Ivybridge (Brilliant).
Highly commended.—W. Hower, Sevenhampton, High-worth (Prince Napoleon).

Cows in calf or in milk.

First prize of £12 to Lady E. Pigot, Branches Park, New-market (Pride of Southwicks).
Second of £6 to J. Lane, Barton (Maid of Athens).
Third of £3 to R. Stratton (Red Coquette).
Heifers in calf or in milk, not exceeding three years.
First prize of £12 to Lady E. Pigot (Princess of Edward).
Second of £6 to E. Bowly, Siddington House, Cirencester (Musical).

Third of £3 J. Lane, Barton (Kiss the 3rd.).

Heifers, not exceeding two years.

First prize of £6 to E. Bowly, Siddington (Chorus).
Second of £4 to Lady E. Pigot (Lady Edburga).
Third of £2 to R. Stratton (Diamant).
Highly commended.—R. Stratton (Fair Duchess, and Parade).
The Class commended.

HEREFORDS.

JUDGES.—J. Buckley.

J. Quartley.

Bulls above three years.

No entry.

Bulls not exceeding three years.

First prize of £15 to W. Taylor, Showle Court, Ledbury (Tamarine).

No competition.

Bulls not exceeding two years.

First prize of £15 to J. Baldwin, Luddington, Stratford-on-Avon (Battersea).
Third of £5 to W. Taylor, Showle Court (Tranquillity).

No second prize awarded.

Cows in calf or in milk.

First prize of £12 to H. Coate, Sherborne, Dorset (Young Eva).

No competition.

Heifers in calf or in milk, not exceeding three years.

Second prize of £6 to Messrs. J. W. and C. J. James, Mappowder, Blandford (Madgie).

No competition.

Heifers not exceeding two years.

First prize of £6 to J. W. and C. J. James, Mappowder (Rose of Mappowder).
Second of £4 to J. Baldwin, Luddington (Adelina).
Third of £2 to J. W. and C. J. James (Nell Gwynne).

S H E E P.

LEICESTERS.

JUDGES.—J. Buckley, Normanton.
W. Trethewy, Grampound.
W. Whippell, Redaway, Thorverton.

Yearling Rams.

First prize of £8 to J. Tremain, Trevarthian, Newlyn Grampound.

Second of £4 to J. B. Corner, Longworth, Wellington Somerset.

Highly commended.—J. Tremain, Trevarthian.

Commended.—J. B. Corner, Longforth; G. Turner, Beacon, Downes; R. Gibbings, Brenton, Kennford, Exeter; and J. Gould, Poltimore, Exeter.

Rams of any other age.

First prize of £5 to G. Turner, Beacon, Downes.

Second of £3 to G. Turner.

Highly commended.—T. Potter, Yellowford, Thorverton, Collumpton.

Commended.—T. Potter (for two other rams); J. Wentworth Buller, M.P.; and J. Tremain, Trevarthian.

Pens of five Two-teeth Ewes.

First prize of £5 to J. B. Corner, Longforth.

Second of £3 to G. Turner, Beacon, Downes.

Commended.—J. Gould, Poltimore; and J. Norris, Huxham.

OTHER LONG-WOOLS.

Yearling Rams.

First prize of £8 to J. Gillett, Fawler, Charlbury, Oxford.
Second of £4 to E. Handy, Sierford, Cheltenham, Gloucester.

Rams of any other age.

First prize of £5 to E. Handy, Sierford.

Second of £3 to T. Beale Browne, Salperton-park Andoversford.

Commended.—E. Handy.

Pens of five Two-teeth Ewes.

First prize of £5 to J. King Tomba, Langford, Lechlade.

Second of £3 to T. Beale Browne.

SOUTHDOWNS.

JUDGES.—J. Humphrey, Oak Ash, Wantage.
J. Whittaker, Bratton, Salisbury.

Yearling Rams.

First prize of £8 to J. J. Farquharson, Langton-house, Blandford.

Second of £4 to R. Neville Grenville, Butleigh-court, Glastonbury.

Highly commended.—J. J. Farquharson.

Commended.—R. Neville Grenville.

Rams of any other age.

First prize of £5 to J. Harding, Higher Waterson, Puddleton, Dorset.

Second of £3 to J. Harding.

Commended.—J. Harding.

Pens of five Two-teeth Ewes.

First prize of £5 to J. J. Farquharson.

Second of £3 to R. Neville Grenville.

Highly commended.—J. Harding.

OTHER DOWNS.

Yearling Rams.

First prize of £8 to J. Moore, Littlecott Farm, Pewsey, Wilts.

Second of £5 to J. Moore, Littlecott.

Rams of any other age.

No competition.

Pens of five Two-teeth Ewes.

First prize of £5 to W. R. Shittler, Bishopstow, Salisbury.

SOMERSET AND DORSET HORNS.

Yearling Rams.

First prize of £8 to T. Danger, Huntstile, Bridgwater.

Second of £4 to T. Danger.

Highly commended.—F. Bond, Whitelackington, Ilminster.

Commended.—Wm. Paull, Piddletown, Dorset.

Rams of any other age.

First prize of £5 to T. Danger.

Second of £3 to W. Paull, Piddletown.

Highly commended.—F. Bond, Whitelackington.

Commended.—F. Bond and T. Danger.

Pens of five Two-teeth Ewes.

First prize of £5 to T. Danger.

Second of £3 to T. Bond, Whitelackington.

Highly commended.—T. Danger.

Commended.—F. Perkins, Grange, Kingston, Taunton.

MOUNTAIN SHEEP.

Rams of any age.

First prize of £4 to Sir T. D. Asland, Bart., Holnicote, Minehead, Somerset.

Second of £2 to Sir T. D. Asland.

Pen of five Ewes of any age.

First prize of £4 to Sir T. D. Asland, Bart.

No competition.

DARTMOOR SHEEP.

Rams of any age.

First prize of £4 to E. Cuming, Linacott, Moretonhampstead, Devon.

Second of £1 to J. Perryman, jun., Yeo Farm, Chagford, Devon.

Pen of five Ewes of any age.

First prize of £4 to E. Cuming, Linacott.

No competition.

HORSES.

JUDGES.—J. Whippell, Barton, Exeter.
H. Hitchcock, Chilterne.

FOR AGRICULTURAL PURPOSES.

For Stallions not exceeding six years.

First prize of £30 to W. King, Withleigh Inn, Tiverton (The Model).

Second of £10 to J. Horwell, North Milton, Lew Down, Exeter (Clydesdale—Stapleton).

Mares and Foal or in-foal.

First prize of £10 to H. Hitchcock, Chilterne Allsaints, Heytesbury (Smart).

Second of £5 to J. B. Corner, Longforth (Diamond).

Colts foaled in 1862.

First prize of £8 to G. Elliott, Swilley Farm, Plymouth (Prince of Wales).

Second of £4 to G. Elliott (Gray Prince).

Fillies foaled in 1862.

First prize of £8 to W. Burrington, Hooper's Farm, Exminster (Blossom).

RIDING HORSES.

JUDGES.—H. Terrell, South Brent, Ivy-Bridge.
R. S. Waters, St. Giles', Salisbury.)

Thorough-bred Stallions.

First prize of £60 to W. Barrett, Puddavon, Totnes (Ratan).

Second of £15 to G. R. Luxton, Brushford, Wembworthy, Devon (The Ball-faced Stag).

Mares and Foal or in-foal, for Hacks or Hunters.

First prize of £10 to G. Hutchings, Cornworthy, Totnes.

Second of £5 to W. Gapper, Duddleston, Taunton (Undine).

Colts foaled in 1862.

First prize of £8 to W. Boyle, Boutport-street, Barnstaple (Barumite, by Gemma di Vergy).

Second of £4 to J. Howard, Alphington, Exeter (Massaroni, by Massanello).

Fillies foaled in 1862.

First prize of £8 to G. Turpin, Berry Pomeroy, Totnes (by Ratan).

Second of £4 to G. F. Hodson, North Petherton.

Mares or Geldings for Hacks or Hunters.

Second prize of £5 to R. Passmore, East Down, Barnstaple (Bessie Swinton, by Swinton).

Cob or Galloway Mare, or Gelding, not exceeding 14½ hands high.

No award.

PONIES.

Stallions of any breed not exceeding 13½ hands high.
 First prize of £5 to E. Maunders, Heasally Mills, Northmolton (Young Bobby, by Bobby).
 Second of £2 to S. Widdicombe, Hay, Ugborough, Ivy-bridge (Exmoor—Favourite).
 Mare Ponies of any breed, not exceeding 13 hands high.
 First prize of £5 to P. H. Turner, Whitlockworthy, Kingsbridge (Chloe).
 Second of £3 to T. D. Acland, Sprydenote, Exeter (Exmoor, Turtur).

PIGS.

JUDGES.—J. Humphrey, Oak Ash.
 J. Whittaker, Bratton.

LARGE BREED.

Boars not exceeding two years.
 First prize of £5 to W. B. Wainman, Carhead, Cross Hills, York (white, Lord of the Wassail).

Boars not exceeding one year.
 First prize of £4 to W. Hower, Sevenhampton, Highworth (Berkshire).
 Second of £3 to W. Yells, jun., Round Robin Farm, Highworth (Berkshire, Conqueror).
 Highly commended.—W. Hower, (Berkshire boar).

Breeding sows.
 First prize of £4 to W. Yells, jun., (Berkshire, Queen of the Vale).
 Second of £3 to W. B. Wainman (white, Fresh Hope).
 Highly commended.—S. Widdicombe, (Salthorpe Lass).
 Pairs of two Breeding Sows, not exceeding nine months.
 First prize of £4 to W. Hower (Berkshire).
 Second of £3 to S. Widdicombe, Hay (Berkshire).
 Commended.—Rev. H. G. Bailey, Swindon; J. K. Tomba, Langford.

Boars not exceeding two years.
 First prize of £5 to G. F. Hodgson, North Petherton, Bridgewater (Leicester, Hammon).
 Second of £3 to Mr. G. K. Radmore, Pitt-Farm, (black, Rover).
 Commended.—W. B. Wainman (white, Silverbeard).

Boars not exceeding one year.
 First prize of £4 to J. Cardell, Pollywin, St. Columb (black, Duke of Cornwall).
 Second of £3 to R. Prout, Milton Abbott, Tavistock (black, Paul Fry).
 Highly commended.—G. Tucker, Wayne Barton; G. Turner, Beacon Downs.
 Commended.—T. Partridge, Bow, Crediton (for two entries); G. Turner (for two entries).

Breeding Sows.

First prize of £4 to Sir Massey Lopes, Bart., M.P., Marston, Plymouth (black, Essex).
 Second of £3 to R. Prout, Milton Abbott (black, Penelope).
 Highly commended.—G. Tucker, Wayne Barton, Ipplepen, Newton Abbott (black); Sir Massey Lopes, Bart., M.P. (black, Essex); E. Coles, Stone Farm, Yeovil (black, Essex).
 Commended.—G. F. Hodgson, J. A. Smith, W. F. Cellier, Woodtown; E. Coles, W. B. Wainman, and R. Prout.
 Pairs of two Breeding Sows not exceeding nine months.
 First prize of £4 to G. K. Radmore, Pitt Farm, Thorverton, Calcompton (black, Devon).
 Second of £3 to W. B. Wainman (white).
 Highly commended.—E. Coles, Yeovil, (black, Essex); and other commendations.

EXTRA STOCK.

£2 to E. Pasmore, East Down, Barnetaple (for brown entire black, two years old, cut, by Swinton); £1 each, Rev. J. R. Widdicombe, Dunstons Rectory, Tavistock (for half-bred gelding Will o' the Wisp by Nutshell); Rev. J. B. Widdicombe (for half-bred gelding Jack o' Lantern, by Vulcan); Mrs. Charlotte Isaacson, Hayne-house, Mortonhamptstead, Devon (for a Guernsey cow, Blomson, and three heifer calves, bred by herself); R. Rendle, Catal-farm, Guernsey (for a Jersey heifer, Lady Jane).
 Commended.—W. K. Brook, Belle-vue-villas, Woburn-on-Trym (for Sunlight, by Young England); W. Gordon, Frank Marsh Farm, Barnetaple (for Norfolk cart horse Young Ring-lender).

SHOEING.

JUDGES.—J. Miles, Exeter.
 H. Tyrrell, Tavistock.

First prize of 3 guineas, G. Moore, Gresham.
 Second of 2 guineas, R. Channing, Exeter.
 Third of 1 guinea, J. Westcot, Exeter.

THE ANNUAL MEETING

Was held on the Thursday, at twelve o'clock, in the show-yard; Mr. E. S. Drews, in the absence of the Marquis of Bath, the President of the Society, was called to the chair.

Mr. ST. JOHN MAULN, the Secretary, read the Report, from which we take the more practical paragraphs:

The Council have the satisfaction to report that the Society in pursuing the useful and beneficial objects for which it was established eighty-six years ago, continues to receive gratifying proofs of public confidence and favour. There are at present, governors 96, members 1,125, life members 50—total 1,271.

EXTRA MEETING.—In the stock department the number of exhibitors is 141, of whom there are from East Somerset 8, West Somerset 18, North Devon 26, South Devon 45, Cornwall 7, Gloucestershire 5, Wiltshire 8, Hampshire 1, Dorset 12, Herefordshire 2, Oxfordshire 8, other counties 6. The entries, which are much more numerous than those at either of the last two meetings, include bulls 54, cows 26, heifers 50—130 cattle; rams 135, ewes 130, wethers 2—263 sheep; horses 25, ponies 31—56 horses; boars 29, sows 45—74 pigs; extra stock 45—total head of stock 567. The plan of open judging has been adopted for the first time, and has not been attended with practical inconvenience.

The Society has long endeavoured to encourage the improvement of horses in the West of England. The season at which the Society's exhibition is held has placed great difficulties in the way. A suggestion that an exhibition of entire horses should be held in the spring has been acted upon as an experimental measure. The Society aims at doing by voluntary agency what in foreign countries is commonly done by legislative or administrative measures, namely, to certify and encourage merit in stallions, to discourage mediocrity, and to give fair notice to the public, by disqualification, of unsoundness or hereditary disease. Eighteen stallions for agricultural purposes, and nine for improving the breed of hunters and hacks, were exhibited at Exeter, on the 20th of March last, in time to carry with them, if necessary, the certificate of the Society during the season. If some horses of unquestionable merit were not placed above all others, they were at least brought before the public, and the knowledge of their merits was, in consequence, more fully circulated. It is hoped that in future years by adequate prizes, and more prolonged notice, the owners of good horses may be induced to send them into the West of England, and that the local standard of horse breeding may be much raised.

In the implement department there is a large increase as compared with former meetings; and in consequence of the extraordinary demands for space, it has been found necessary to provide 2,267 additional yards of canvas. The total extent of shedding erected by the Society for all purposes is 6,104 feet run.

The special prizes for shoeing, again most liberally offered by Mr. Miles, of Dix Field, Exeter, have led to very spirited competition. The work has been done at portable forges in the yard, in the presence of a large number of spectators, who have shown much interest in the proceedings.

The prize offered through this society by a committee of agriculturists in the county of Cornwall, for the best

essay on "The Lamb Disease," of which parasites in the lungs are generally the cause or consequence, has been awarded by Lord Portman, chosen by the donors as adjudicator, to Dr. Edwards Crisp, of Chelsea. This valuable essay has been published in Vol. XI. part 1 of the Society's Journal, and is by this time in the hands of all members whose subscriptions are not in arrear. It has also been printed in a separate form for the use of those in whose liberality the offer of the prize originated.

In accordance with the established rule the society will hold its meeting for the year 1884 in the eastern division, and the council have accepted an invitation from the city of Bristol. The council are happy to report that all obstacles have been surmounted by the energy and the public spirit of the citizens of Bristol; that they are now in the possession of a most eligible site on Durdham Down, where an abundant supply of water has been secured to the society for three months, together with the liberal sum of £1,000.

The council recommend the election of the Right Hon. the Earl Fortescue as president of the society for the year 1883-4. The following members of council retire by rotation: Eastern division—G. H. Andrews, John Ballward, George Bullock, W. E. Gillett, J. D. Hancock, Joseph Lush, H. A. F. Luttrell, H. G. Moysey, S. Pitman, E. Pope, Robert Smith, William Thompson; western division—Edward Archer, John Belfield, M. Farrant, W. Froude, J. Gould, J. Hooper, Thomas Hussey, James Pitt Pitts, Wm. Porter, W. R. Scott, N. Whitley, Wm. Wippell. To supply the vacancies thus occasioned the council recommend the election, from the eastern division, of G. H. Andrews, W. A. Bruce, R. H. Bush, Henry Fookes, W. E. Gillett, J. D. Hancock, H. P. Jones, Joseph Lush, H. A. F. Luttrell, H. G. Moysey, S. Pitman, William Thompson; western division—Edward Archer, George Braginton, M. Farrant, W. Froude, J. Gould, J. Hooper, Thomas Hussey, James Pitt Pitts, Rev. T. Phillpotts, William Porter, W. R. Scott, William Wippell.

Sir J. DUCKWORTH, Bart., moved the adoption of the report. With reference to the allusion in the report to the open judging—as it had been called—which had been practised by the society, for the first time, this year, he said he did not know exactly on what specific ground the system had been adopted; but it really appeared to him, when he was present, to be of no advantage whatever; on the contrary, he thought it was attended with considerable disadvantage (Hear, hear). He was at a loss to see the advantage, because the public were kept back some fifty yards from the gentlemen who were judging, although he admitted that the judging was perfectly open (Hear, hear). It appeared to him, looking at the manner in which it was carried out, that no advantage was to be derived from the presence of the public; because they were kept at so great a distance from the judges; and, in his opinion, he thought they would be much better out of the yard altogether. The judges may be so well acquainted with many of the animals exhibited, that, almost at the first glance, they were enabled to say which was the best; but he was inclined to the opinion that open judging would lead the judges to arrive at their decisions without any complete knowledge of the properties of the animals. Although it had been decided by the council that no catalogues should be issued until the prizes had been awarded, yet he found that there was no difficulty in ascertaining to whom the animals belonged (Hear, hear), and it was generally known. He believed the best plan was to admit no person in the yard until the judges had arrived at their decisions.

Capt. POOLE seconded the adoption of the report.

Mr. DUCKHAM said that he had not noticed any practical inconvenience arising from public judging. Open judging was adopted by the Yorkshire society, by the Royal Society of Ireland, and by the Royal Society of England; and he repeated that he had never heard of any practical inconvenience. He pointed out the good it would do the Society's funds by having an extra day for the public, inasmuch as the prizes would be awarded on Monday instead of Tuesday. Besides, he was of opinion that it gave the Society's meeting an additional interest, and it would be productive of advantage for the agriculturists to assemble and watch the judges get through their task; and he thought that the mere discretion of keeping back the public fifty yards could not give rise to any suspicion.

Mr. GEORGE TURNER expressed himself in favour of open judging, because it enabled the young men to attend, and learn a little. He asked the Secretary to inform him of the proportion of practical farmers with those of the gentlemen submitted for their adoption by the Council.

The SECRETARY here read the list of names as given above.

Mr. TURNER said there was a feeling out of doors that there were not sufficient practical men on the board (Hear, hear).

On the motion of Mr. T. D. ACLAND, seconded by Mr. N. GRENVILLE, the Right Hon. Earl Fortescue was elected President for the ensuing year. Mr. T. D. ACLAND moved, and Earl DEVON seconded, that Lord Bath be added to the list of Vice-presidents. Earl Portsmouth, Sir Massey Lopes, and J. Belfield, Esq., were also elected Vice-presidents of the Society.

Considerable discussion followed as to Mr. Turner's remarks respecting the election of the Council; and Capt. POOLE pointed out that theirs was a society dissimilar from other large societies, for they sought the promotion of agriculture, arts, and commerce; and, therefore, they wanted in the Council representatives of all the departments. After some remarks from Mr. Grenville, Mr. J. Gray, Mr. Duckham, Mr. J. Daw, Mr. Drewe, Mr. Thos. Wills, and Mr. Colville, the names as they stand in the report were agreed to.

The Marquis of BATH, who had entered during the proceedings, said that, as the formal part of the meeting was over, he trusted that the matter with which he was going to make them acquainted would be gratifying to them, and would meet with their approval. Some months ago, on the death of Lord Lansdowne, the Council considered it expedient to ask His Royal Highness the Prince of Wales to become the patron of the Society. After stating that he could not communicate with his Highness during his wedding festivities, he said that as soon as affairs got a little more settled, he entered into communication with His Royal Highness through Lord Mount Edgcumbe, one of the lords in waiting, who asked him if he would take the office; and he had that morning received a letter from General Knollys, informing him that His Royal Highness would accept the patronage of the Bath and West of England Society (loud applause).

On the motion of the Earl of DEVON, seconded by Mr. T. D. ACLAND, it was resolved that a letter be written to General Knollys, requesting him to convey to the Prince of Wales the respectful acknowledgments of the Society, for the honour he had been pleased to confer on them by becoming their patron, and their marked sense of the benefits that would result to the Society from such a step (cheers),

and that the President kindly undertake to transmit the same.

On the motion of Sir J. DUCKWORTH, seconded by Mr. J. W. BULLER, M.P., the thanks of the meeting were accorded to the Marquis of Bath, who suitably acknowledged the compliment, and the meeting separated.

THE DINNER

Was held in a spacious tent, which was not exactly like a sieve, but it was certainly not much unlike one. Those who had the courage to dine in such weather were compelled to keep on their hats and Macintoshes, and even these were an insufficient protection against the copious and drenching rain that descended during the whole of the proceedings.

The chair was occupied by the Marquis of Bath, supported by the Mayor of Exeter (Mr. W. Barnes), the High Sheriff of Devon (Sir G. S. Stueley), the Earl of Devon, Lord Courtenay, Sir J. T. B. Duckworth, the Hon. C. R. Trefusis, M.P., Mr. J. W. Buller, M.P., Mr. S. T. Keke-wich, M.P., Mr. R. S. Gard, M.P., Mr. T. D. Acland, &c., &c.

After the customary loyal and complimentary toasts,

Lord DEVON proposed "The Royal Agricultural Society of England."

Mr. T. D. ACLAND responded. The Royal Agricultural Society had been founded some years ago, by men who had the confidence of the British farmers, and who, if he might say it without giving offence, were in the habit of looking further ahead than those with whom they had been acting. The founders desired to see all possible power put in the hands of the farmers, and to lay before the public the experience that they obtained, so united and adapted as to be within the reach of every educated man, whether farmer or otherwise; also to put a further means in the hands of the farmer of improving the agricultural machinery and implements which were best suited for his purpose: and secondly—and he was now treading on delicate ground—to assist by competition the improvement of the live stock of the country. In these departments, the Royal Society had in the early part of the nineteenth century followed the example set by the Bath and West of England Society in the eighteenth century; and great had been the benefits which had resulted from their labours to the country at large. Mr. Acland then proceeded to speak of some of the results which had been shown by the test of experiments, and observed that, when steam engines were first introduced into the West, it was thought that one of three or four horse power would be far better adapted for the small holdings of the district than the eight or ten horse power, as used in Lincolnshire. But experience had proved this was erroneous, and that the West Country farmers required the larger engines, and for this reason—that, whereas the Lincolnshire farmers had very large estates, and could command a large amount of labour, the farmers in the West of England had fewer labourers at command, and necessarily required a greater amount of steam power than the larger agriculturist. Adverting to the subject of implements, Mr. Acland observed that the Royal Agricultural Society could not at any meeting have exhibited such a show as was to be seen in that yard. The Bath and West of England had not for some years given prizes for implements; and the leading members of the Highland Agricultural Society had been conferring with the council of this society, with the view of adopting a similar course. The Royal Agricultural Society, however, thought it right to have scientific and prize trials for implements. The chief manufacturers did not exhibit at the shows of the Royal; and there were

good reasons why they did not. He wished that the great farmers of England would follow the example set by the implement-makers, and look upon these meetings as merely large agricultural fairs, to which if they sent their stock, it would be gladly welcomed. The Royal Agricultural Society was originally established with the view of keeping up pure breeds; but he was convinced that no agricultural society could keep up a breed at all: the breeds kept up would be those which best paid the farmer to purchase. He was not a practical judge of stock; but he wished to say a word or two with reference to the North Devon stock. They had heard enough of this endless quarrel about size and quality, and the time for speaking out on this question had now come. He had often wished the North Devon breeders would get their steers a little bigger. The Bath and West of England Society, it was said, never did justice to the North Devon breeders; and there were threats of not appearing at the present show, and that they would teach them a lesson. He had not been round the yard yet—that was a pleasure he always postponed to the last day of the show—but he was informed that Mr. James Quartly was of opinion that it was the best show of Devons he had ever seen.

PROFITS OF STOCK FEEDING.—FARMERS' FALLACIES.

SIR,—I have frequently said that in my practice pigs lose less money than any other stock. In this farmers generally disagree with me, and take an opposite opinion. I could never ascertain the exact grounds on which they based their opposition, until I read in your recent paper a discussion by the Dorchester Farmers' Club on a paper read by Mr. Saunders. The calculations arrived at by this meeting very much astonish me as a man of business, and if other portions of farming practice are resolved upon similarly erroneous estimates, we must consider our agronomic economy in a most unsatisfactory condition. If I make comparison between sheep, pigs, and bullocks, I charge them equitably or equally with the market price of their food. Not so the Dorchester farmers. They charge hay and roots to their sheep and bullocks at feeding prices; hay at £3 per ton, and roots at 7s. per ton; but the pig food is charged at selling or market price! Now with us the market price of hay is £5 per ton, and of roots 14s. per ton; so that the poor pig, consuming corn at market price, has to contend with a discrepancy of from 40 to 50 per cent. against him. This is unfair and unbusiness-like. There are obvious reasons why a pig should pay best. When you sell a pig you get paid meat price for his skin, which, as in all other animals, forms a material percentage of his weight. Again his head, with the skin on, sells at quite half meat price. He makes a quicker return for his food, which, being of a concentrated nature, involves less cost of attendance; and, if properly attended to, he is rarely attacked with disease. The principal objection to pig-feeding is a limited market, for, especially at certain seasons, the markets are soon overdone with pork; whereas there is always a market for beef and mutton. Thousands of pigs get diseased by burying themselves in manure, or holes rooted in the ground. A pig floor should always be either of brick covered with cement, or a wooden sparred floor; stable-dung or a thick bed of manure heats them, after-exposure chills them, and they then get "heaves," or lung disease. When I had hundreds I seldom lost a pig. I have been a good deal snubbed because I maintain that live stock are necessary evils, but we never see any one, not being a farmer, fattening animals with purchased food as a source of profit. I commend, however, every farmer to keep much stock, and purchase much food; for what he loses by his stock will be more than repaid by the extra produce resulting from abundant manure. There is no difficulty in making stock "appear" to pay if you knock off some 40 per cent. of the market price of the food which they consume. Yours, &c., J. J. MCHIE.

ROYAL CORNWALL AGRICULTURAL ASSOCIATION.

MEETING AT TRURO.

Considering that Cornwall does not rank among our agricultural counties, we were very much pleased to find so large and creditable a display of stock at its annual meeting; the committee deserve every praise for the excellent arrangements. The stock had the comfort of covered sheds during the hottest day we have had this season, while a field was devoted to an excellent exhibition of implements from some of the principal makers of the kingdom, either by themselves or their agents, together with some of the local makers. We should hardly suppose that Cornwall opens up a fine field for this branch of business, as the majority of the holdings are on a very small scale, and there does not appear to be that disposition to encourage the progress of agriculture on the part of the landlords, so characteristic of many of our large landed proprietors in the purely agricultural counties: it may be they are content with the advantages they derive from the bowels of the earth; but from what we have seen during a few days' sojourn in the county, we firmly believe that there is a large breadth of land that would well pay for clearing, if encouragement were given to skilful and enterprising tenants, such that have made the sands of Norfolk and the Wolds of Lincolnshire what they now are. To come to matters more nearly connected with the show, we would observe that in most of the classes there was a good competition. The Herefords we considered were well represented, Mr. Oliver taking the lead, followed by the county member Mr. Davey, and Mr. Lobb, of Lanhitton. Mr. Oliver's bull possesses great substance, but has plain shoulders, while his colour in our opinion is hardly orthodox. The two cows of this gentleman possess considerable merit. The Devons come out some 50 strong, and were a great feature of the Show. We observed here, as at some other shows, that the pretty little things carried the day, while some larger animals, of as good shape and perhaps as fine quality, were not noticed. We were struck with Mr. Tremain's stock as possessing greater size; we would mention his cow Rose, and his second-prize cow Queen of the West; the latter is a good animal, with a very nice top. The other successful exhibitors in this class were Viscount Falmouth, Messrs. Soley, Anstey, Harvey, Clark, Treffry, Palmer, and Rabey, all showing very creditable animals. Cornishmen have not gone along in Shorthorns as we expected to have found them: the honours they ought to have received have been taken from them principally by strangers. We were surprised to find that the fair occupier of Branches Park had sent her favourite herdsman with a batch of her herd into this corner of the island, who, with the "Hero of the West" in Shorthorns, our old friend of Broad Hinton, pretty nearly swept the deck of all the prizes. The Messrs. Hoeken, of Haigh, who it will be remembered took honours at Battersea, came, however, to the rescue, and with a bull of considerable merit, possessing great size for his age, with a good top and extraordinary shoulders, succeeded in placing the Broad Hinton bull "Windor Castle," second best; they also took a prize for a cow of great frame and good quality. It is a matter for the consideration of the committee whether they will for the future throw open their show to these perambulating Shorthorn exhibitors, who, as it were, make a trade of it: they have now had an opportunity of seeing what

good animals will do, and we would advise them to follow the course adopted by Messrs. Hoeken, Messrs. Trethewy, and some few others, by purchasing some good male animals; their show of shorthorns will then be worthy of that magnificent breed for which their county is well adapted. Messrs. Trethewy showed some very good animals, but not in show-yard trim to meet Lady Pigot or Mr. Stratton. In the young-bull class there was some little dissatisfaction given by the award of the judges. The first prize went to Lady Pigot's one year and six months old bull "Pan." We were certainly surprised to find that her ladyship should have sent so unworthy a specimen of her herd into this distant county; but, notwithstanding all his defects in his twisted hind legs, patchy rump, and cocked up horns, yet, from his good hair and superior quality, we consider the judges were fully justified in placing him as they did, for he was decidedly the best of a very sorry lot. We understand the judges wished to withhold the first prize altogether, but were overruled by the committee. The show of sheep was small, with the exception of Leicesters, Mr. Tremain showing a very superior lot of animals that would cut a good figure in any show-yard. We cannot congratulate our Cornish friends upon their show of horses. The agricultural horses we could hardly think answer that description, but for the light land and hills of Cornwall may be all that is required. There was rather a large show of hackneys, but, with one or two exceptions, very moderate animals. Mr. Jonathan Gray was the successful exhibitor and winner of the 40-guinea challenge cup with a very good-looking colt. We would advise the Cornish farmers to read the very cleverly-written paper upon the breeding of hacks and hunters that has recently appeared in the Bath and West of England Society's Journal. They will find in that a course laid down, which, if they adopt, will lead to a considerable improvement in their breed of horses. There was but a small show of pigs, with but one exception of the black breed, they all possessed considerable merit.

LIST OF PRIZES.

JUDGES.—*Devons and Herefords.*—Mr. Tanner Davey, Southmolton; Mr. Walter Farthing, Stowey Court, Somersetshire; Mr. John Dingle, Darley, Linkinhorne.

Shorthorns.—Mr. Charles Howard, Bedfordshire; Mr. Edward Little, Wiltshire; Mr. J. Moon, Maristow, Devon.

Sheep and Pigs.—Mr. J. Bodley, Crediton; Mr. S. Treawna, Probus; Mr. George Radmore, Thorverton, Devon.

Horses.—Mr. Edward Collins, Truthan; Mr. E. Tucker, St. Germans; Mr. R. Pollard, Bodve, Wadebridge.

DEVONS.—For the best bull above two years on the 1st of June, 1863, £10, Mr. John Sobey, Trewolland, Meheniot; for the second, £5, Mr. William Treffry, Ruansayhorne; for the third, £3, Mr. William Clark, St. Ewe, bred by Mr. Anstey, Menabilly Farm.

For the best bull not exceeding two years old on the 1st of June, 1863, £10, Mr. James Tremain, Trevanthen, Newlyn; second, £5, Mr. Thomas Palmer, Stokeelmiland; third, £3, Mr. Anstey, Menabilly Farm.

For the best cow above three years old on the 1st of June, 1863, £5, Viscount Falmouth; second, £3, Mr. James Tremain, Newlyn; third, £2, Mr. John Rabey, of Hensdr, Liskeard.

Highly commended.—Mr. William Harvey, Trellisick, Hayle.

For the best heifer not exceeding three years old on 1st June, 1863, £5, Mr. W. Harvey, Trellisick, Hayle; second, £3, Mr. Thomas Palmer, Stokedismalund; third, £2, Mr. T. Palmer, Stokedismalund.

For the best heifer not exceeding two years old on 1st June 1863, £3, Mr. William Harvey, Trellisick, Hale; second, £3, Mr. James Tremain, Newlyn; third, £2, Mr. William Harvey, Trellisick, Hayle.

Northons.—For the best bull above two years old on 1st June, 1863, £10, Messrs. W. Hosken & Son, Hayle; second £5, Mr. Richard Stratton, Wall's Court, Stapleton, Bristol; third, £3, Mr. Hendy, Tremouth, Probas.

For the best bull not exceeding two years old on 1st June, 1863, £10, Lady Emily Pigot, of Branches Park, Newmarket; second, £5, Mr. Samuel Widdicombe, Hay, Ugburgh; third, £3, Messrs. Tedder & Pridham, Truro.

For the best cow above three years old on the 1st June, 1863, £5, Lady Emily Pigot; second, £3, Mr. Richard Stratton, Stapleton, Bristol; third, £2, Messrs. William Hosken & Son, Hayle.

For the best heifer not exceeding three years old on 1st June, 1863, £5, Lady Emily Pigot; second, £3, Mr. Richard Stratton; third, Mr. George Williams, Scornier.

For the best heifer not exceeding two years old, £5, Lady Emily Pigot; second, £3, and third, £2, Mr. Richard Stratton. Commended, Messrs. William Hosken & Son.

Herefords.—For the best bull of any age, £10, Mr. Thomas Oliver, Penhallow, Philligh; second, £5, Mr. G. Lobb, Lawlittion.

For the best cow above three years old on 1st June, 1863, £3, and second, £3, Mr. Oliver.

For the best heifer not exceeding three years old £5, Mr. Oliver; second, £3, Mr. Richard Davey, M.P., Polens House.

Special prize of a Silver Cup, value £5, given by Mr. C. Childs, of Liskard, for cows of any breed, for dairy purposes, Messrs. Tedder & Pridham, Truro, a six years old Jersey cow from the islands.

Leicester Sheep.—For the best yearling ram, £6, second, £4, third, £3, and commended, Mr. James Tremain, Newlyn.

For the best old ram, £6, Mr. John Nicolls, Linkinhorne; second, £4, Mr. James Tremain; third, £3, Mr. William Trefry, Ruanlaniborne.

For the best pen of five old ewes, £4, Mr. John Thomas, Phillack; second, £2, and third, £1, Messrs. G. Mason and Son, Kenwyn.

For the best pen of five yearling ewes, £4, Mr. James Tremain; second, £3, and third, £1, Messrs. G. Mason and Son.

Sheep of other Breeds.—For the best long-woolled ram, not being Leicesters, £5, and the best pen of five long-woolled ewes, not being Leicesters, £3, Mr. John Gatley, Polens, St. Erme.

For the best Down ram, £5, and the best pen of five Down ewes, £3, Viscount Falmouth, Tragothan. Commended, pen of five Down ewes, Wm. Peel, Esq., Tennant Park; and pen of five Down ewes, Messrs. Tedder and Pridham, Truro.

HORSES.

For the best stallion for agricultural purposes, £10, Mr. Wm. Hawke, Budock, "Hero;" second, £5, Mr. Joseph Reynolds, Perransabuloe, "Young Oxford."

For the best mare for agricultural purposes, £5, Mr. James Tremain, Newlyn; second, £3, Mr. George Leach, St. Gluvias. Commended, Mr. John Jacks, Marazion; and Mr. Thomas Croghan, Creed.

For the best hack or hunter stallion, £10, Charles Trelorey, Esq., Coldremlack; second, £5, Mr. Thomas Abbot, Hayle.

For the best hack or hunter mare and foal, or in foal, £5, Mrs. Oliver, St. Clements; second, £3, Mr. James James, jun., St. Mawes. Commended, Mr. George Biddick, Feock.

For the best three years old gelding, £3, Mr. Michael H. Williams, Tredrea; second, £2, Mr. William Michell,

Gwennap. Highly commended, Mr. Richard Gill, St. Allen. Commended, Mrs. Grace Paull, Redruth.

For the best three years old filly, £3, Mr. Reginald Vyvyan, Withiel; second, £2, Mr. Richard Veale, St. Columb.

Special Prize given by Lord Vivian, Lord Falmouth, and Mr. Bridges Williams.—For the best half-bred horse or mare foaled in 1859, got by a thoroughbred horse, and bred in Cornwall, a silver cup, value £20, Mr. William Michell Gwennap.

HUNTERS.

The Challenge Cup, of about the value of £40, given by Six Gentlemen of the County.—For two years old colts or fillies, Mr. Jonathan Gay. Commended, Mr. John Jacks, Marazion, and Mrs. Oliver, St. Clements.

PIGS.

Large Breed.—For the best bear, £3, Mr. T. D. Eva, Camborne.

For the best sow, £3, Mr. John Widdicombe, Torrhill, Ivybridge; second, £2, Mr. Richard Gill, St. Allen.

Small Breed.—For the best bear, £3, Mr. John Knight, Truro; second, £3, Mr. John Verce, Ladock. Highly commended, Mr. John Cardell, Lower St. Columb.

For the best sow, £3, Mr. John Knight, Truro; second £2, Mr. Richard Gill, St. Allen. Highly commended, Mr. T. D. Eva, Camborne.

PRIZES FOR IMPLEMENTS.

JUDGES.—Messrs. Thomas Oliver, Truro; Henry Trevenen, Lanhydrock; W. James, Merther.

THE ROYAL MEMORIAL PRIZES.

For the best plough for general purposes, £3, Messrs. Hornsby and Son.

For the best turn-wrest plough, which will efficiently turn the furrow against the hill, £3, Mr. John Davey, St. Germans.

For the best cultivator, grubber, and scarifier, £3 10s., James Buckingham, Northhill.

For the best set of harrows, 10s., W. Brenton, Polbathic.

For the best set of seed harrows, 5s., Philip Blamey, Truro, manufactured by Howard.

For the best chain harrow, 10s., James Buckingham.

For the best clod crusher or pulveriser, £1 10s., Philip Blamey, Truro, manufactured by Cambridge.

For the best turnip and mangold drill, for ridge or flat depositing manure with seed, £3, W. Brenton, Polbathic.

For the best general manure distributor, £3 10s., W. Brenton, Polbathic.

For the best horse-hoe for green crops, in the ridge and flat, adapted to work horizontally along the side of a hill, £1, John Davey, St. Germans.

For the best haymaking machine, £1 10s., James Buckingham, manufactured by Boby.

For the best horse-rake for collecting hay or corn, 15s., Wm. Gerrans, Tregony.

For the best winnowing machine, £1, W. Brenton.

For the best one-horse cart for general purposes, 10s., James Buckingham.

PRIZES OFFERED BY THE SOCIETY.

For the best reaping machine, £5, divided between Buckingham and Best.

For the best grass-mowing machine, £5, divided between Buckingham, Best, and Blamey, for their Wood's machines.

For the best chaff-cutter, worked by horse, water, or steam, £1, W. Best, manufactured by Redcliffe.

For the best machine for grating or pulping roots, 10s., Messrs. Hornsby.

For the best turnip cutter, 10s., Messrs. Hornsby.

For the best corn and pulse crusher, £2; and for the best clod crusher, 10s., P. Blamey, Truro.

For the best collection of agricultural implements and machines manufactured in the county, £5, W. Brenton, Polbathic; second, £3, W. Gerrans, Tregony; third, £2, Mr. Buckingham.

For the best sheep-feeding hurdle-rack, 10s., W. Brenton, Polbathic.

OXFORDSHIRE AND BANBURY AGRICULTURAL SOCIETY.

MEETING AT OXFORD.

This meeting was held on Wednesday, June 10, a very injudicious fixture, as clashing with that of the West of England Show at Exeter.—In Class 1 the entry of old bulls was a very middling one, Mr. Langston, M.P., taking the prize with "Royal Arch," an animal with some good points about him, but rather deficient in quality, still by far the best of his class; Mr. Gaskell, second prize, with a very useful farmers' bull, bred by Mr. Langston. Class 2: Bull under two years old was a very inferior lot indeed, Mr. G. Garne taking both prizes; the animal placed first was of very bad colour, marked so as to remind one of a Hereford cross. The decision of the judges was much questioned in this class; but we do not wonder at their being rather puzzled, among such a lot of moderate ones, as to which to award the prize to. Mr. Garne admits himself, that the best animals were at the Bath and West of England Show, and hence those sent here were only seconds. In Class 3, Mr. Langston's cow, "Dandelion," white, with roan calf by her side, was a really good animal, and fit to go into any show-yard in England; she deservedly took first prize. Class 4 contained two very inferior beasts. Class 5 produced a really good heifer, the property of Mr. Taylor, of Kingham, to which the first prize was given, as also the cup as the best in any of the horned classes; colour roan, quality very good, a fleshy massive heifer, and, but for a very slight deficiency on the chine, would take some beating, even at the Royal, to which we believe she goes, when all the world will have an opportunity of judging of her merits. Mr. J. Garne's second prize heifer was a big roomy animal with quality hardly up to the mark. Class 6, a very middling lot indeed; those shown by Mr. Druce were entered 1 year 6 months instead of 16 months, and were thus thrown out of competition, but could have carried all the honours, as they were by far the best of the class; those to which the prizes were awarded would be thought by some farmers not good enough to breed from. Class 7: First prize to a very big good cow of Mr. Newton's, of Campsfield, one of the old sort, great size, fair quality, and looked like milking; her companions not worthy of notice. The cattle shown were all shorthorns.

THE HORSES.—Class 9: The prize to an old worn-out well-bred mare with colt, by, we believe, a cart horse—the Oxfordshire notion of breeding hunters, a queer one certainly; they evidently do not set much value upon blood. Class 10: First prize to a useful Suffolk mare of Mr. Druce's; the one shown by the Earl of Macclesfield, a good mare, but she did not come in time for the judge's award, or would have been placed; the others a set of brutes. Class 11: First prize, a thick, short, and compact horse of Mr. Hutt's, a pretty good mover, but with a rather plain head. Second, to His Grace the Duke of Marlborough, for a horse whose legs were neither big nor yet strong enough to carry his immense carcass, and he could not walk a yard, a great fault in a cart horse.

SHEEP (Oxfordshire Downs).—Class 12: All the best sheep in this class disqualified, on account of being shorn before the time (1st April) as defined by the rules of the

society; the prizes given to very middling sheep indeed, and we could not help noticing that scarcely any of the breeders appeared to know what an "Oxfordshire Down" ought to be. Surely three things are necessary—size, a dark face, and a heavy fleece. If some of them shown in this class were "Oxfords," we are afraid it will be some time before the owners establish as a breed such a non-descript lot. We do hope the society will against another year alter this rule, as it keeps out those men who are preparing for the "Royal," and even spoils the show of sheep pens. Class 13: Again the best withdrawn from competition by the stewards, from the wool being too long. Some very fair sheep in this class. That shown by Mr. Bryan, of Southleigh, to which the first prize and cup was given, was a good sheep, and something like an Oxford. Not much can be said of the rest. Class 14: A pen or two of useful ewes; first prize to Mr. Batten's short, thick, compact sheep, very fat, and barely wool enough about them for our liking. The Duke of Marlborough's second prize pen were very nice quality, but with such bad necks that they could not be placed any higher. Class 15: The Duke of Marlborough's pen of sheep disqualified, on account of shearing too soon; some grand good sheep, and if the breeders keep up to this standard, the sort will soon become more famous than it now is. Prize to Mr. Druce, for a pen of useful sheep, "bare shorn" a few days before the show. Class 16: Plenty more disqualification, with even Mr. T. Beale Brown among the number! It appears to be one thing to preach, but quite another to practise. After what Mr. Brown has penned lately, one did not expect to find him transgressing. We hope he will take a lesson from this. Both prizes to Mr. W. Cother, for two very pretty sheep, but not near big enough for our taste, as, if you do not get size in a Cotswold, what else can you expect? for it is nothing but their size that has brought them into such repute for crossing our smaller breeds. The rest of the sheep comprised one of the late Jonas Webb's and some "Shropshires," that look as if they were mixed with the Oxford, but without the good qualities of either.

PIGS.—A very middling lot, that do not call for any remarks.

The judges of stock were Mr. J. Coleman, of Woburn; Mr. E. Little, of Lanhill, Wilts; and Mr. W. Shaw, of Far Coton, Northampton.

The dinner was, as usual, a tame affair. Mr. Henley, M.P., presided, with Col. North, M.P., Col. Fane, M.P., Sir Hy. Dashwood, and Mr. W. J. Sheldon supporting him, together with 70 or 80 farmers. No Oxford men there, save one worthy alderman, who was very amusing. Considering the University draws most of its income from landed property, some of its members might have paid the farmers the compliment of meeting them; but there was not even one of the cloth to say grace. The chairman was very doleful about the prospects of the society, and hinted at its being given up; but the farmers will hardly agree with him. Still they must be up and doing before another year, or the county of Oxford will sink even lower than it now is in the scale of agriculture.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL: Wednesday, June 3.—Present, Viscount Eversley, President, in the Chair; the Duke of Marlborough, Lord Feversham, Lord Leigh, Lord Portman, Lord Tredegar, Lord Walsingham, Hon. W. Cavendish, M.P.; Major-General Hon. A. N. Hood; Sir E. Kerrison, Bart., M.P.; Sir A. Macdonald, Bart.; Mr. Amos, Mr. Raymond Barker, Mr. Barthropp, Mr. Bramston, M.P.; Mr. Bowly, Mr. Dent, M.P.; Mr. Druce, Mr. Ezall, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Holland, M.P.; Mr. Wren Hoskyns, Mr. Humberston, M.P.; Mr. Jonas, Mr. Lawes, Mr. Lawrence, Mr. Milward, Mr. Pain, Mr. Randell, Mr. Shuttleworth, Colonel Towneley, Mr. Wallis, Mr. Burch Western, Professor Wilson, Mr. Frère, and Dr. Voelcker.

The following New Members were elected:—

Abell, James, Leopard Grange, Worcester.
 Allen, Newland, The Vache, Chalfont St. Giles, Bucks.
 Bambridge, Robert S., Woodhorn Grange, Morpeth, Northumberland.
 Baker, Charles Newcombe, Half-moon Passage, London, E.C.
 Baker, Samuel Camfield, Beaufort-street, King's Rd., Chelsea.
 Barber, William, Elm Hill, Grimley, Worcestershire.
 Beach, John Allen, The Hill, Staunton Swan, Worcestershire.
 Beachell, John, Rawcliffe, Selby, Yorkshire.
 Bealey, John Edward, Blexwith, Walsall, Staffordshire.
 Bentley, William Handy, Sansome Place, Worcester.
 Berkeley, Robert, Spetchley Park, Worcestershire.
 Bomford, Hemeing James, Dunnington, Leicester, Warwicksh.
 Boomer, W. Griffiths, Holme Lacy, Hereford.
 Bradburn, William, Hilton, Wolverhampton.
 Caldwell, Bonham, Leominster.
 Chalk, Thomas, Barbourne, Worcestershire.
 Chesterfield, The Countess of, Brethby Park, Barton-on-Trent.
 Clark, William, Hepscott Hall, Morpeth, Northumberland.
 Cleasby, John H., High Heworth, Gateshead.
 Cobb, Thomas, Radnor Cliff Villa, Sandgate, Kent.
 Collier, W. F., Woodtown, Tavistock, Devon.
 Collins, Barnabas, Hunston, Ipsworth, Suffolk.
 Corlea, Edward, The College Green, Worcester.
 Cotterell, Sir Henry George, Garons, Hereford.
 Crawshaw, Edward, Othorpe House, Market Harboro'.
 Crossley, Sir Francis, Bt., M.P., Somerleyton, Lowestoft, Suffolk.
 Cutting, Robert Cote, Biddington, Uppingham.
 Dobson, Francis, Wilderwick House, East Grimstead.
 Diamond, James, Beer Ferris, Tavistock.
 Dyson, John, 24, Dock Street, Leeds.
 Fair, Jacob Wilson, Lymn, Warrington.
 Fries, Count August, Moravia, Prats, Brüm, Austria.
 Gandy, Rev. James H., Castle Eaton, Fairford, Wilts.
 Gardner, Richard W., Parsonage, Ombereley, Droitwich.
 Gilstrap, George, Winthorpe House, Newark-on-Trent.
 Goldingham, H. G., Newland Court, Malvern.
 Hardon, Edwin, Edgeley, Stockport.
 Hales, Clark, Manor House, Basingbourne, Royston, Cambridgeshire.
 Harris, John Sutton, Keyworth, Notts.
 Helps, Arthur, Vernon Hill, Bishop's Waltham, Hants.
 Herbert, Edmund, Powick, Worcestershire.
 Heygate, Robert H. J., Docklow, Leominster.
 Heygate, Captain E. N., Buckland, Leominster.
 Hodgeson, Richard, Crofton Mills, Blyth, Northumberland.
 Howard, R. G. F., Temple Bruer, Lincoln.
 Hurt, Albert F., Alderwasley, Belper, Derbyshire.
 Hunter, Samuel S., Old Court, Abergavenny.
 Johnson, James, East Harptree, Bristol.
 Johnston, Alex. E., The Grove, Oxford, Suffolk.
 King, Richard H., Wooperton, Alnwick.
 Lea, John Wesley, Stanfield House, Worcester.
 Le Grand, Emile, Woodhorn, Morpeth.
 Lacey, Charles, Lanner, East Peckham, Kent.

Lewis, Richard Ed., Westw. Moak Hapton, Bridgnorth, Salop.
 Lindsay, Robert L., Lockinge, Wantage, Berks.
 Mackinder, Herbert, Mere Hall, Lincoln.
 Maddock, Henry, Sealand, Chester.
 Mannsfeld, Count Do'risch, Prag, Austria.
 Meir, Henry, Green Gates, Tunstall, Staffordshire.
 Miles, Charles Wm., Burton Hall, Malmesbury, Wilts.
 Mousley, Geo., Hoxton Hall, Chester.
 Mulliner, Job, Royton Farm, Wrexham, Denbigh.
 Nevett, Wm., Yorton Villa, Harmer Hill, Salop.
 Nevill, Thos. Montford, Shrewsbury, Salop.
 Ogles, Charles, Rawcliffe Bridge, Selby.
 Pattison, Thomas, Newcastle-upon-Tyne.
 Pearce, George, Walcot, Pershore, Worcestershire.
 Perkins, Joseph, jun., Loughton, Sheddington, Rugby.
 Phillimore, Edward, Cheltenham.
 Phippe, Thomas, Brickhampton, Pershore.
 Powis-Lybbe, Philip Lybbe, M.P., Hardwick, Reading.
 Richardson, Richard, Halewood, Prescott, Lancashire.
 Riddell, John, Bewick Folly, Alnwick.
 Rix, Nathaniel, jun., London Colney, St. Alban's.
 Sample, Thomas, Bathal Castle, Morpeth.
 Scott, Wm. C., Thorpe, Chertsey, Surrey.
 Seamas, Joseph, Worcester.
 Shipway, Wm., Hanley Castle, Upton-on-Severn.
 Sheriff, Alex., Clunes, Worcester.
 Shield, John, jun., 66, Grey Street, Newcastle-on-Tyne.
 Smith, John, Althrey, Wrexham.
 Smith, Thomas, Little Mollington, Chester.
 Stallard, John, Worcester.
 Steward, Wm. Lambton, Fence Houses, Durham.
 Swan, Wm. Walker, Newcastle-on-Tyne.
 Talbot, Wm., jun., Lane House, Burton, Westmoreland.
 Taylor, John, Rajmahal, Bengal.
 Thompson, Francis, Burton-on-Trent.
 Tomes, Alfred, Rouse Lench, Evesham.
 Toondrow, H. T., Redmarley, Dabitol, Newent.
 Travers, Robt. F., Great Cariton, Louth.
 Upall, Thos. B., Sheepcote Street Works, Birmingham.
 Waddington, J., Langrish, Petersfield, Southampton.
 Webb, William, Worcester.
 Webb, William, Chemical Manure Works, Worcester.
 Williams, Edwin, Llanestone Farm, Ross.
 Williams, Henry Edward, Manor House, Brannaton, Rugby.
 Wittenoom, Charles, Perth, Western Australia.
 Wood, Joseph, Lansdowne Villa, Worcester.
 Wood, Walter A., 77, Upper Thames Street, E.C.
 Woodhouse, Edward, Worcester.
 Worcester, The Bishop of, Hartlebury, Kidderminster.

FINANCES.—The Hon. Major-General Hood presented the report, from which it appeared that the Secretary's receipts during the past month had been examined and found correct. The balance in the hands of the bankers on the 31st of May was £2,297.

JOURNAL.—Mr. Thompson, M.P., reported that the Committee recommended that on Wednesday the 24th inst., the subject for a lecture and discussion be as follows, viz.: "On the Application of different kinds of Manure to Grass Land," by Professor Voelcker.

On Wednesday, the 10th inst., Mr. Coleman will read a Paper "On Breeding and Feeding Sheep, with a view to increasing the Sheep Stock per acre." The committee begged leave to defer reporting further respecting the preparation of an Index for the 25 Vols. of the Journal until next month.

CHEMICAL.—It is proposed by the committee that the lecture by Dr. Voelcker on "The Comparative Effect of different Manures upon Grass Lands," which was originally fixed for Wednesday, May 20th (Derby Day),

shall be given on Wednesday, the 24th of this month. It will be remembered that Mr. Lawes has kindly promised to place the general results of his valuable experiments on this subject at the aid of the lecturer. The attention of the Committee was drawn to the case of pastures infested by weeds injurious to young stock; a correspondence having recently taken place on the part of Dr. Voelcker with Mr. Howard, of North-leach, respecting a field (situated in that locality), on which lambs never thrive, suffering injury to such extent as to cause death if they are not removed in time. It was found on examination that a plant grows on this field not met with elsewhere in the district; specimens were forwarded and identified as Wild Parsley (*Petroselinum segetum*). Whilst upon this subject Professor Voelcker referred to a correspondence with Mr. Meynell Ingram, on the subject of the supposed deleterious effect of water supplied to his kennels in preventing the breeding capacity of the hounds through wasting (in the nature of *tabes testicularum*). Professor Voelcker had submitted the water to a careful analysis, and discovered it to contain a large proportion of organic matter (4.75 grs.). Supposing this to be the result of decomposed animal substances, the injurious effect of it appeared to the Professor to be partially accounted for. There was nothing in the inorganic constituents at all likely to cause injury. It was unanimously resolved that Professor Voelcker's attention should be directed to the determination of the practical value of salt as a fertilizer. Such very opposite opinions being in existence amongst the highest authorities on this subject, it is thought well worthy of careful and continued field experiments. The present Laboratory subjects are—1st, the solubility of phosphatic matter, and 2nd, the means of rendering guano more effective, both by composition and mode of application. The next Journal will contain a paper by the Professor on Milk.

VETERINARY.—

REPORT OF THE GOVERNORS OF THE ROYAL VETERINARY COLLEGE TO THE COUNCIL OF THE ROYAL AGRICULTURAL SOCIETY, FOR THE YEAR 1862-3.

The Governors of the Royal Veterinary College have the satisfaction of presenting their Annual Report to the Council of the Royal Agricultural Society, and in so doing they desire, in the first place, to express their gratification at the increased interest which, during the past year, the Members of the Society have taken in the alliance existing between the two Institutions. The communications received from various parts of the country seeking advice with regard to the nature and causes of diseases among cattle and sheep, with a view either to prevention or cure, have considerably exceeded those of former years; and being steadily on the increase, afford good proof that the advantages possessed by the College in disseminating sound pathological principles are duly appreciated by the owners of stock.

The Governors are fully persuaded that this improved state of things is due to no other cause; as the communications chiefly refer to ordinary, not to extraordinary and unusual cases of disease. They are, moreover, assured that disease upon the whole has not been more prevalent than in former years.

Many cases of great practical interest to the agriculturist have also been received from practicing Veterinary Surgeons, and these having been first published in the pages of the "Veterinarian," and often with comments by the professors, have subsequently been reproduced in the public papers, particularly in those which circulate among the farming community. By this means valuable information has been brought directly home to the members of the Society and others who are interested in the well-being of the stock of the farm.

The malady above all others which has excited public attention during the past year has doubtless been the small-pox of sheep. The sudden and unexpected outbreak of this disease in an extensive sheep-breeding district in an inland county, could not fail to create the deepest anxiety, especially when it

is remembered that on the former appearance of this disease in England it spread over the whole eastern division of the kingdom, and destroyed many thousands of sheep. On that occasion also its devastating effects were continued for a period of nearly three years, notwithstanding all the efforts which were made to arrest its progress, among which was the passing of a special Act of Parliament, "The Sheep and Cattle Contagious Act." The introduction of this disease from the continent was at that time clearly proved; and although its outbreak on the late occasion has not been so satisfactorily traced to a continental origin, there is still no reason to believe to the contrary, or that it has had a spontaneous origin in this country.

The Professor of Cattle Pathology was early on the spot, and gave his unremitting attention for an almost unbroken period of three months to the means best calculated to exterminate the disease. These efforts, aided by the co-operation of your Society and of the Government, and supported by the agriculturists themselves, proved eminently successful, so much so indeed, that after a few months not a single case of small pox existed, save among those sheep reserved for scientific purposes. A series of experiments early directed by the Government, are being carried out with a view of ascertaining the best means of protecting sheep against an attack of this fatal and loathsome malady. The solution of this important question has been confided to Mr. Marson, Surgeon to the Small Pox Hospital, and to Professor Simonds. The Governors of the Royal Veterinary College have freely lent all the assistance in their power to the Commission. For this purpose they have kept for several months a number of sheep at the College, which have in turn been brought under the disease by inoculation, in order to furnish the necessary supply of small pox lymph for the experiments.

The advantages possessed by the College Infirmary for such a purpose will be apparent to every one, particularly when it is remembered that these sheep have been kept perfectly isolated from all others, without the least risk being incurred of the spread of this highly contagious and fatal malady.

Besides the small pox of sheep many flockmasters in the northern and western divisions of the country in particular have sustained rather serious losses from the prevalence of rot, arising from the excessive rainfall in the early part of the summer of last year. The Governors would therefore call the attention of agriculturists to the system of preventing this destructive disease which has been advocated by the Professor of Cattle Pathology in an elaborate paper, which has been published in the Society's Journal, containing recommendations both scientific and practical. These losses, added to those which took place in 1860-61 from the same disease have tended to diminish the supply of sheep to a very serious extent, and it is therefore a subject of thankfulness that the present lambing season has hitherto proved more than usually prolific. The weather for the last few weeks has been all that could be desired, and the losses consequently of ewes and lambs have been much less than in ordinary seasons. In some few exceptional cases, where a special cause has been in operation, as for example, the supplying the ewes through out the winter with too great a quantity of untopped turnips in consequence of a superabundant supply of food of this kind, the withholding of all corn, cake, or hay, many ewes have been affected with venous congestion in some part or other of their organisms, and particularly at the time of parturition, which has quickly terminated in death. To great care in regulating the amount of green vegetable matter especially in the form of turnip sprouts, given to in-lam ewes, so as to maintain a healthy state of their systems, cannot be observed, and attention of this kind is particularly needed during an early and warm spring as in the present year. Where this precaution has been taken all has gone on satisfactorily; where neglected, serious losses have occurred. In a few instances also, but from causes not so apparent, a large proportion of lambs have been found to be affected with paralysis at the time of their birth. The Professor has under investigation a case of this kind which occurred in the count of Sussex, and in which the deaths have reached a high percentage. The flock is a very valuable one, and apparently has been well managed, circumstances which render the investigation the more difficult. It is believed, however, the sufficient light will be thrown on the causes to elucidate the adoption of means, which will effectually prevent a similar

occurrence—a desideratum most important as no curative means can possibly prove of any avail. The other chief malady from which sheep have suffered, during the year, has been an affection of the lung, produced by worms, *filaria*, within the bronchial tube. This parasitic disease, in common with others of the same class, has evidently been on the increase for the last few years. The cause of this is not well understood, nor can it be, except by a patient and long-continued research into the natural history of each individual parasite. Investigations of this kind have long occupied the attention of professors of cattle pathology, some of which have already been made public, as for instance the natural history of the liverfluke, the cause of the rot in sheep. In the pulmonary disease alluded to, lambs and young sheep are the chief victims, and the general symptoms which the animals exhibit, as an almost continuous cough, which is increased by exertion, a tedious appetite, and a falling away in condition. In most instances these symptoms are succeeded by diarrhoea, which he quickly carried off the patient. The success of treatment mainly depends on an early attention to the case; if this be neglected, the remedies, otherwise most effectual, will be of but little service. The inhalation of a medicated air, such as that produced by the mingling of diluted chlorine gas with the atmosphere of a shed into which the animals are driven or the burning of sulphur with tar, often proves very efficacious, especially if conjoined with a few doses of turpentine and linseed oil, in quantities of half a drachm of the former in two of the latter, given daily for three or four days in succession. Chalybeate tonics, such as the sulphate of iron, are highly beneficial, and so also is a moderate quantity of salt, when mixed with the animal's cake or corn diet—a variety of food is imperatively needed in all these cases. No new epizootic has shown itself among the cattle; but both the lung disease, pleuro-pneumonia, and the mouth and foot disease, *Eczema epizootica*, have been as rife as in former years. The contagious nature of these affections is being more generally admitted, and to the extent that this opinion gains ground, and care is taken to prevent diseased animals coming in contact with the healthy, will be the limitation of these diseases. The Governors have so often spoken of the means best calculated to prevent the extension of pleuro-pneumonia in particular, or its occurrence on a farm, that they deem it unnecessary to add to this report on this subject. Suffice to say that where the prophylactics, which they have in former reports recommended, have been rigorously enforced, the disease has been cut short in its progress, and the lives consequently of many animals have been saved. The same fatality which belongs to pleuro-pneumonia in England attends it in all other countries, and, as such is the case, the Governments of most of the continental states have long since made the disease the subject of special legislative enactments—an example which perhaps it would be right for us to follow.

With regard to the educational departments of the College, to which the Governors attach the greatest importance as being the means by which the country will ultimately be furnished with a number of scientific practitioners equal to the requirements of every district, they have to report that the lectures and clinical instructions have been daily continued, and that the number of pupils in attendance has been as numerous as in any former year.

Since the last report the number of pupils having passed the preliminary examination instituted by the Governors, subsequently obtained the diploma of the Royal College of Veterinary Surgeons, amounts to 40. The entrance also during the year of pupils has been a full average. The system of education has differed in no essential particular from that which has proved so effective heretofore. Four lectures a week have been delivered on the nature, causes, and treatment—preventive and curative—of the diseases of cattle, sheep, and pigs, during the seasonal year of seven months, and clinical instructions have been daily given whenever bovine or other animals of the farm have been forwarded to the College Infirmary. Many morbid specimens, in addition to those sent by the members of the Society, have also been procured for the demonstration of the various forms of disease, so that the pupils have been continually instructed either theoretically or practically in this branch of their profession.

Valuable assistance has likewise been given by all the professors to the advancement of the science of Cattle Pathology,

in the delivery of the lectures, practical demonstrations, dissections and clinical observations, and also by the inculcation of a knowledge of chemistry—organic and inorganic—material medica, and toxicology.

Before concluding this report the Governors would call attention to the completion and publication of a new register of the qualified members of the profession, by which agriculturists will be enabled at once to ascertain whether those who call themselves veterinary surgeons in their respective neighbourhoods are in reality scientifically educated practitioners. Many persons who can lay no legal claim to the title still continue thus to designate themselves. This is a subject of some importance to the agricultural community, as it appears from a statistical return, which has just been obtained by the Royal College of Veterinary Surgeons, that while there are 914 members of the College settled in practice within the United Kingdom, there are no less than 1,244 individuals who assume the name of veterinary surgeon, besides 1,189 farriers. Thus it is seen, that much still remains to be done by the united efforts of the Royal Agricultural Society and the Royal Veterinary College. The Governors trust that they have adduced sufficient evidence in this report of their determination to fulfil the conditions of their alliance with the Royal Society in full integrity. They consider the interests of the agricultural community to be most identified with their own; they require only the cordial co-operation of agriculturists in their efforts to improve the veterinary art in its application to cattle, sheep, and pigs. No means, which are at their disposal, have been spared to accomplish this improvement. They have especially sought to give practical effect to the provisions of the Society's charter by engraving sound principles of medical science upon the minds of their pupils, the future members of the profession.

C. N. NEWDEGATE, Chairman.

Mr. Raymond Barker having presented the report from the Royal College of Veterinary Surgeons, moved that the usual grant of £200 to the College be continued for the current year. The motion having been seconded by the Hon. Major-General Hood, was agreed to.

GENERAL WORCESTER.—Lord Portman reported that the Contractor was making satisfactory progress in the works of the Show-yard at Worcester. His Lordship having moved that a sum not exceeding £30 be allowed for enclosing additional space if found requisite by the Honorary Director, and that a sum not exceeding £100 be placed at the disposal of Mr. Pain for advertisements and placards, the same were agreed to. The trials of Steam Cultivators will take place on the same days as the other trials, viz., July 15, 16, 17, and 18.

On July 21 and 22, these implements will be exhibited to the public in motion on land in the vicinity of the Show Yard.

The Secretary was directed to send a notice to each exhibitor of steam-engines not to use any coal except smokeless, or coke.

Lord Portman, in bringing forward his motion that the quadrennial arrangement for the trials of implements being about to expire, it is expedient to consider on what system any prizes for implements shall be given in future, remarked that the subject was one requiring careful consideration, and moved that it be referred to the Implement Committee to prepare a new quadrennial scheme for prizes for implements, which was acceded to.

Sir Archibald Macdonald having moved, and Mr. Wren Hoskyns seconded, that Mr. John Hungerford Arkwright be appointed Steward Elect of Implements at Worcester, the same was agreed to.

The Council having decided that the Judges for the various classes exhibited at Worcester should be appointed by the Council without the previous recommendation of a Committee, the President ordered a Special Council to be summoned for this purpose on Wednesday the 17th inst., at half-past 12 o'clock.

Mr. Lawes, of Rothamsted, presented a handsomely bound copy of his works—"Memoirs on the Chemistry of

Animal and Vegetable Growth;" "Rothamsted Memoirs"—Vol. 1, Feeding Experiments; Vol. 2, Field Experiments. And Mr. Bailey Denton presented the 2nd Part of his "Farm Homesteads of England;" for which the best thanks of the Society were accorded.

The Council then adjourned.

THE BREEDING AND FEEDING OF SHEEP.

At the weekly meeting of the Society, held on Wednesday, June 10, in Hanover-square, Lord Bernal in the chair, Professor Coleman, of Cirencester, introduced as the subject for consideration and discussion "The Breeding and Feeding of Sheep," with a view to increasing the sheep-stock per acre.

Mr. COLEMAN said:—The subject I have the honour of introducing for discussion this morning is one of very great importance at the present time, perhaps equally so with that which so lately occupied your attention, viz., "Steam Cultivation"; for the successful development of either must tend to the same result, viz., the more economical, because more abundant, production of corn. It is hardly necessary to point out that the history of prices during the last few years clearly shows that corn produce must range at very moderate rates, rates which would formerly have been considered ruinous to the English agriculturist, but which, thanks to our increased resources—thanks to the great stimulus which such tremendous competition has produced—we now look forward to without despair. One great lesson that our experience has taught us is that we need not henceforth look only or principally to our cereal produce, but must endeavour to draw our returns from an increased growth of meat. It would be interesting and useful to have statistics as to the number of sheep, horned stock, &c., bred in the United Kingdom; in the absence of these we can only draw general conclusions from the prices that are realised. The scarcity of meat during the last few years, and the very high prices obtained, would lead us to infer that production does not keep pace with the increase of population. It also proves that in this branch of our produce we have little to fear from foreign competition. That live stock, and especially mutton, cannot be imported to any considerable extent, the following figures, taken from the accounts relating to trade and navigation for the years 1860 to 1862 will amply testify—

	MONTH OF DECEMBER.		
	1860.	1861.	1862.
Sheep and lambs.....	76,728	89,294	56,276
Oxen, bulls, and cows	16,785	15,076	14,553
Calves.....	5,938	4,005	4,782
Swine.....	4,417	8,293	1,377
	YEAR ENDING 31st DECEMBER.		
	1860.	1861.	1862.
Sheep and lambs.....	320,219	312,923	299,472
Oxen, bulls, and cows	77,010	81,194	68,818
Calves.....	27,559	25,902	29,069
Swine.....	24,452	30,308	18,162

Supposing that the live weight of each beast is equal to that of ten sheep, and each calf to two sheep, we have twice the weight of horned stock imported to sheep; and we have the importations steadily declining from 1860 to 1862, notwithstanding that prices of meat ranged high during those years—mutton by the carcass ranging from 5d. to 6½d. per lb. It would be equally easy to show that the British isles are naturally adapted beyond most other countries for the growth of meat, whether we consider the moisture of the climate and the sudden and frequent changes we experience, which along our western shores renders all the strongest land suitable for pasture, or the capability of our dry uplands to carry forage crops. The question for us to consider is, how can we best make use of these natural advantages and adapt our system to the altered conditions that surround us. On the one hand

we are told to lay down our land to grass, on the other to give up corn-growing, and substitute crops that afford sheep food. Where land, owing to soil and climate, is especially adapted for grass, it may be profitable to lay it down, though there is very little grass land that pays without a considerable proportion of arable land to work with it; and, instead of laying down land, we should act wisely if we adopted a more generous treatment of the present grass land. No portion of our produce is more grateful for judicious outlay. Too often we find the arable land absorbing everything in the form of manure, and the grass land being mown every alternate year. It may be well here to state that in laying down land to permanent pasture much evil has resulted from injudicious grazing with sheep; close feeding by heavy or old sheep will destroy the clovers and finer description of grasses, and with a cropped surface root-growth is impossible; as well might the forester expect to grow timber if he carefully cropped off all the branches. Manuring with composts of well-decomposed manure and soil, mowing young, and afterwards grazing with lambs and calves, will produce a finer and thicker sward in a shorter time than by any other plan. Those who would have us abandon corn-growing have never accurately considered how far live stock can be made to pay for the crop they consume. Finding, for instance, that sheep produce a large gross return, they are apt to consider that this is all profit; whereas it is not difficult to show that sheep alone, and without reference to their influence on the corn crops, will not pay a living profit after all the expenses of growing the crop are considered. Thus a teg in good condition of the long wool breed will be worth 40s. on October 1st. From this to the 1st of April—183 days—it will consume about 4½ lb. of oilcake a day, about 8s. worth of artificial, and 1½ tons of swedes at 8s. a ton, 12s. Add to this, attendance 2s., interest of money 1s., 5 per cent. of loss about 2s., and we have a total of 65s., which represents a full value for carcass and wool. If we wish to make a similar calculation for breeding sheep, we should doubtless find the return exceeded the cost; but, taking into consideration the risk attending breeding, it is very doubtful whether, independent of the corn produce, even breeding sheep would return a living profit. Moreover, we know that there is a limit to the extent we can stock and crop land; therefore, regarding the subject from all points, it is clear that on arable land we cannot profitably abandon cereal growing. We may possibly alter our system so as to bring corn less frequently on the same ground; but such alteration must be made with a view to an increased produce per acre. The point, then, that I would suggest for your consideration is to a more economical system of feeding sheep, especially breeding sheep, so as to increase the return, and at the same time leave the land in better condition for the corn. And this would, I believe, be effected by reducing the quantity of roots, and using more dry food in the form of straw, combining with this a small quantity of artificial food, which will act as a stimulus to digestion. By adopting a system of this sort we shall have the land in a much richer condition for corn, because the sheep will take a much longer time to consume a certain weight of roots, the animals will be in a better condition than when eating as many turnips as they can consume with little or no dry food. It is calculated by Morton and others that a breeding ewe will consume one-fourth of its live weight of turnips. This gives a quantity of from 20lbs. to 30lbs. a day. The per-centage of water in common turnips is over 90 per cent., and hence it follows that a sheep eating 20lbs. of roots daily takes into its system 18lbs. and upwards of water. This food is often during winter very little above freezing point, and it follows that much heat will be absorbed, and consequently food wasted in raising this volume of water to the temperature of the animal's body. Water within, and often water without, the temperature of the body must be greatly reduced, and we are not surprised that with such an unscientific mode of feeding, the animal cannot maintain its condition, and is unable to minister to the wants of the fetus. The latter is often chilled, and dead lambs are the result, especially with young ewes in a wet season. Now, if we can by any means reduce the quantity of roots one-half, and substitute an equivalent in the form of straw and condimental food, at the same time attending to the external comfort of the animal, we shall have

achieved a great success. The land will be doubly manured, straw will be made more of than when trodden solely into manure, and a greatly increased number of sheep can be kept upon a given weight of roots. It is only of late years that the feeding value of straw has been ascertained or believed in, and even now there are many who profess to consider it only fit to be trodden into manure. That straw varies much according to the nature and condition of the soil, and more according to the mode of harvesting, no one will dispute; but there is abundance of evidence to show that when cut green and carefully managed many kinds of straw are exceedingly nutritious. The tables that I have prepared sufficiently illustrate this; and from personal experience I am fully convinced that good straw may be economically substituted for hay in the winter feeding of breeding sheep, even without any artificial food, though the cost of the latter, as I trust to be able to show, is no slight that it can be economically employed. The following calculations will show the effect of carrying out this system both on the land and the animal—

An acre of turnips = 15 tons.
Amount of nitrogen left as manure, 74lbs.
Amount of mineral matter, 800lbs.

The analysis of the mineral matter gives—

Per acre.	
110.94 Potash	36.98
20.28 Soda	6.76
1.77 Chloride potassium ..	.59
23.55 Common salt	7.85
10.83 Magnesia	3.61
33.42 Lime	11.14
29.22 Phosphoric acid	9.74
37.29 Sulphuric acid	12.43
10.29 Silica	3.43
3.27 Iron	1.09
19.14 Carbonic acid	6.28

lbs. 800.00 100.00

Such would be the manuring value of an acre of turnips consumed by sheep eating 20lbs. of roots daily, and no dry food. If we give each ewe 10lbs., and substitute $1\frac{1}{2}$ lbs. of straw, it follows that with every acre of turnips 2 tons 4 cwt. of straw will be eaten. Straw on an average yields $\frac{1}{2}$ per cent. of nitrogen; therefore 2 tons 4 cwt. = 24.6lbs. nitrogen, of which 21.6 lbs. left as dung, $\frac{1}{2}$ being consumed in exhalation from the animal's skin, &c. The same quantity of straw will yield 221.1 lbs. of mineral matter as manure. Of this, a considerable portion, about 48 per cent., is silica; but the remainder contains very valuable minerals, which are most necessary as plant food. The addition to the soil of this large amount of silica, in round numbers about 107lbs., in a condition available for plant food would act beneficially on the following barley crop, which requires more silica in grain and straw than any of the other cereals.

Analysis of ash of out-straw.	Quantity returned per acre as manure.
Potash	42.29
Soda	21.41
Magnesia	8.85
Lime	17.83
Phosphoric acid ..	5.65
Sulphuric acid ..	7.80
Silica	107.00
Peroxide of iron ..	4.04
Common salt ..	7.18
100.00	220.95

We may fairly calculate that giving ewes $1\frac{1}{2}$ lbs. of straw per day will increase the value of the manure more than one-half. Many of the root crops grown for breeding sheep do not reach to 15 tons per acre, and according to the common plan of feeding off, the sheep run over the ground so rapidly that a good dressing of manure cannot be left behind, and hence we comparatively fail in one of the most important objects for which we keep sheep. But by diminishing the quantity of roots half, and substituting dry food to the extent I have named, we keep the stock twice the time on the same land, and greatly increase the dressings. Let us next consider how

far straw compensates the animal for the loss of half the turnips. 15 tons of turnips will yield in round numbers 3,024lbs. of dry matter. 2 tons 4 cwt. of straw will yield 4,233lbs. The proportion of this latter that would be digested is a point on which unfortunately we have no very precise data. A series of carefully conducted experiments would be very valuable. Much depends upon the condition of the straw.

ANALYSIS OF OAT STRAW, CALCULATED DRY.

	I. Green.	II. Fairly ripe.	III. Over ripe.
Oil	1.88	1.25	1.49
Soluble protein compounds ..	6.56	3.13	1.54
Insoluble do. do.	3.54	1.74	2.79
Sugar, gum, mucilage, &c.	19.07	12.59	3.78
Digestible fibre	31.36	35.92	33.04
Indigestible woody fibre....	29.60	37.84	49.80
Soluble mineral matter ...	6.86	4.31	2.70
Insoluble do. do. ...	1.13	3.22	4.86
100.000 100.00 100.00			

You will observe by reference to the analysis of the oat straw that the proportion of soluble and insoluble woody fibre differs immensely, according to the condition of ripeness. The chemist concludes that what he calls digestible woody fibre (as being soluble in dilute acids and alkalies, similar reagents as far as he can judge to the gastric juice and biliary secretions) would be converted by the digestive process into food, and that all that resists such tests will pass through the system, being insoluble. It is highly probable that this is so, and that the digestive system of the animal is even more powerful than the reagents he can command. From my own experience as to the effects of using good straw, I should consider that from half to three-quarters of the dry matter would be available as food. Supposing, however, for the sake of argument, that only one-half this dry matter of the straw is available, whilst the whole of the dry matter in the turnips can be made use of, which is never absolutely correct, there being in full-grown turnips about 3 per cent. of woody fibre, and in certain conditions of growth, when the plant is over-ripe, and especially towards spring, when the flower-stem is shooting, there is a very considerable proportion of insoluble matter, we have the straw yielding 2,116 $\frac{1}{2}$ lbs. of available food, against 3,024lbs. in the turnips; and it follows that sheep eating turnips and straw, and thereby economising the consumption of the root crop one-half, consume per acre 5,140lbs. of dry matter against 6,048 lbs. when feeding solely on turnips. Surely this difference will be partly compensated for in the healthier condition of the sheep eating so considerable a proportion of dry food. Less fuel will be required to maintain the heat of the body, because less water will have to be heated. Scouring, which in bad weather is common to ewes eating only turnips, is rarely seen where straw is consumed. I have experienced the most satisfactory results from using straw for breeding sheep on the Cotswold Hills, and I am satisfied that with such feeding the sheep may be kept up to or near lambing time in a healthy thriving state. The addition of a very small quantity of artificial food would doubtless prove a good investment both as regards the land and the animal, enriching the manure to some extent, but acting principally as a stimulus to the digestive powers of the animal. The cost per head would be very small. Thus, 100 sheep eating off 15 tons of turnips as proposed would take 33 days, and if supplied with $\frac{1}{2}$ lb. a-day of artificial food, would eat 825lbs. The food would cost probably about £8 a ton, and might be composed of equal parts of—

Rapeseed or nut meal.....	£7 0 0
Beans, peas, or lentils.....	8 10 0
Indian corn	7 0 0

£22 10 0

To this we may add 9lbs. fenugreek

Ditto 6lbs. aniseed

£8 0 0

Nutmeal is a comparatively new feeding article, and is valuable chiefly on account of the large proportion of oil it contains, varying from 16 to 25 per cent. It is the meal produced in the palm-nut-kernel oil manufactory, and is prin-

cipally sold by A. Smith & Co., Liverpool. Present price, £6 a ton. Beans, peas, or lentils, all closely analogous in composition, contain 24 to 26 per cent. of nitrogenous compounds, and hence are very suitable for growing stock; and crushed Indian corn contains much feeding matter; and a meal composed of these ingredients is both cheap and nourishing. The addition of the comparatively small proportion of fensugreek and aniseed gives a flavour to the whole, and acts as a tonic to the digestive system. The cost per acre of the artificial food is £2 19s., and a considerable portion of it is left as manure. The total quantity consumed by 100 sheep during six months amounted to 2 tons 2 qrs. 14lbs., or 3s. 3d. per head. Of this, one-third will be returned in increased wool, especially in longwooled sheep, one-third left as manure, and one-third will be paid for in the improved condition of ewe lambs. Two years since, wishing to economise the roots, we supplied our young ewes with a quarter of a pound a day of nutmeal, with chaff, and a very small quantity of roots; and they thrived wonderfully.

METHOD OF USING STRAW.

Having, then, endeavoured to show that straw may be economically used with roots for sheep, the next point will be to ascertain how it can be best supplied. The present system of using straw is, either long, in racks, or as chaff. The latter plan does not answer, as bad and good are so mixed that the animal refuses all, and the expense of cutting is not paid for. The former plan is by far the best, when the straw can be thrashed and stacked in the same field where the roots are being consumed. Nothing can answer better, unless it can be shown that a system of pulping roots and cutting chaff can be economically carried out. I have the experience of a very good flockmaster in support of this plan. Three hundred ewe tegs first eating hay, 600 ewes follow, eating up the huds, and lie back at night on a foldyard of straw, kept well littered by the refuse removed from the racks. It is surprising what a large quantity of straw may thus be consumed, with what a small quantity of turnips the ewes will thrive, and what a rare manure-heap results, this manure coming in for the young needs the following autumn, with the minimum amount of labour. A system of this sort is well suited to large breeding farms, where buildings often are remote, grass land at a much lower elevation, and where consuming straw at the yards would greatly increase the labour. I may mention that the order of using straw should be as follows: Good sweet barley straw first. This may be commenced when ewes are eating mangold-tops, &c. This will do till November. Then oat or beam straw, the latter most valuable in cold weather; and lastly, pea straw, which, when well made, is equal to much of the seed hay made on light land; and this may be given with a portion of hay, when ewes are lambing. Our practice is to build a good stack of freshly-thrashed pea straw in the ewe pen, often forming a wall of division, and fodder once a day with this and once with hay. Sheep thus fed will be most conveniently managed with nets, instead of hurdles, as less work is required in setting a fold; and the turnips should be first picked up, at a cost of 1s. 6d. an acre. Where ewes are allowed a full quantity of turnips, and the crop is a fair average one—say 18 to 14 tons per acre—the common rule is to allow one hurdle to each sheep. Thus 100 sheep require daily 10 hurdles square. This applies to large-framed sheep.

PULPING STRAW AND ROOTS.

We have now to consider whether any system can be economically arranged for pulping the roots and mixing them with straw and chaff. We all know what a great improvement has taken place in the feeding of horned stock by the use of the pulper—how animals that formerly consumed from 1½ to 2 cwt. of roots daily when sliced are now better fed on 70lbs. to 80lbs. with 15lbs. to 20lbs. of straw. Shorthorn cows dried off previous to calving, being in an identical condition with the breeding ewe, can be kept in a good store state upon 25lbs. to 30lbs. of roots and straw. The digestive apparatus of sheep is very similar; and yet, though only one-tenth the weight of the cow, we find ewes eating 20lbs. to 30lbs. of turnips almost without dry food. Surely we have here evidence of an extravagant system. The difficulty lies in carrying out the plan economically. Many will say that the labour is too great, and that breeding sheep so treated will not pay for attendance. In reply I would ask, what por-

portion does the cost of consuming bear to the cost of growing? An acre of swedes can seldom be produced under £5. To clean and cut up the same according to our present system would not exceed £1. Double the expense, and carry twice the sheep and the cost accordingly, and the result obtained will be as £3 10s. to £6. That breeding sheep will readily eat food so prepared I have proved by experiment, and that they must thrive much better on such a mixture than on roots alone is also certain. I would sketch out for your consideration the following plan: The corn stacked in a convenient position thrashed, and straw, &c., carefully stacked and thatched; roots cleared in large heaps and at such distances apart as would allow of sheep lying two days on the same ground, using a combined pulper and chaff-cutter on wheels, and worked by the horse-gear; a light roomy house on wheels, with canvas sides, to store mixture for use on second day; four days a-week one horse and a lad employed extra; a load of straw, first carted from stack to heap of roots, then the two cut up, produce of morning's work used for day's food—that cut later in the day stored away in house for the following day. Messrs. Samuelson and Co., of Banbury, inform me that they make machines of the sort which, worked by two men, will turn out 100 bushels of the mixture per hour. I merely advance this idea in the hope that it may lead to some opinions from those who are so competent to judge. I think it would do best on dry healthy land; but where, as is often the case, a considerable per centage of clay exists, the land is at times so sticky and wet that a good lodging at night is of the utmost importance; and the sheep thrive best when lying back on a well littered fold, and supplied with straw in racks; and whichever system may be found most paying, whether pulping or gnawing, the health of the animals will be maintained and food economized by supplying them with dry lodgings. Before the ewes go to the lambing pen they should be dressed with a solution to destroy lice and ticks. This prevents all the rubbing which is otherwise common. The best plan is to have a double line of hurdles set up, four feet apart, suppose about eight to ten hurdles long, at each end more hurdles at right angles, so as to form entrance and exit places. The ewes draw in and stand so close together that if they are easily handled by the attendants—three in number—one holds the sheep, another attends to the liquid, and hands it to the third, who, with an old tea-pot or similar vessel, with a spout, pours the solution along the back from head to rump, three times backwards and forwards, one pint of liquid to each sheep. The quieter ewes can be kept during all stages of pregnancy the better. Instances have occurred of abortion at three weeks from fright caused by a dog. Later on, the necessary forces are increased. Only last lambing we had an instance of this. The ewes, when within a few days of lambing, were disturbed by some students trying to catch them, and numerous dead lambs and cases of false presentation resulted.

FIRST-CLASS RAMS DESIRABLE.—In breeding it is always desirable to use first-class sheep. The males should be of higher quality than the females; but more especially is it important to select the very best animals to put on young ewes, for the character given to the first produce will often come out again. About this there cannot be the least doubt. With regard to the proportion of male and female lambs and the use of double or single lambs, it has been supposed that the condition of the parents at tupping influences the result. Young vigorous lambs will get the larger part of their stock male; doubles depend very much upon the condition of the ewes. If ewes are poor and doing badly, doubles will be scarce; if in good, hard condition, and rather improving, we may expect more doubles. The nature of the farm as affecting the quality of the food has also a good deal to do with this.

MARKING RAMS—THE WASHPOOL.

The plan of marking the breast of the ram with ruddle is convenient, enabling us by alteration of mark, after three weeks, to draw out the forwardst ewes for the pen. The ram remains for six or eight weeks; after which barren ewes may be withdrawn, being proved by a teaser marked a different colour. Where a convenient washpool exists on a farm, it will be found very desirable to swim the ewes occasionally, though of course, unless great care is exercised, this might be attended

rit risk when they are in year. The skin is apt to become dry and harsh; the water cleanses the pores and encourages circulation through the skin, and consequently relieves the central organs, which are always more or less taxed in sheep. In the case of fever, especially when these result from hard keeping, swimming will prove most advantageous. From eight to ten days should always elapse between washing and shearing, in order that the yoke may rise.

FOOD AFTER LAMMING.

The ewes after lambing continue on turnips and swedes. Good crops of the former may be obtained after early vetches. At this time the proportion of dry food must be lessened, and a few mangolds introduced. Lambs soon learn to run through lamb hurdles, and may have a fold ahead, being supplied with small quantity of artificial food, consisting of pounded linseed-cake, bruised oats, pot bran, and malt combs in equal proportions. The quantity consumed will be very small, as the great object is to teach them to eat, so that when a change of food, &c., requires better treatment, no time may be lost. The management of the young lambs for the first five or six months is the most difficult. They are very susceptible to unfavourable circumstances, and bad food for two or three days only will often permanently check the lambs. As soon as the root crop is dispensed with, couples go on seeds which are folded off. Two plans may be followed, either to keep the ewes in close quarters, having a lamb pen ahead, and shifting often twice a day, or else to let them lie back on the ground they have already cleaned. The first plan is best for the keep in dry weather, but does not do so well for the ewes which have a better lodging when allowed more range. Still, by the first plan, land is evenly fed off and manured. Lambs must never lie back, as the young shoot of clover and ryegrass is sure to produce scour from its unripe state. Mangolds cut up in troughs for the ewes at this time will be very good food. The seed should be mown if possible after being fed, even should the crop be light. This is more especially desirable when we have mixed seeds, clover, ryegrass, and hop trefoil. The sheep do not do nearly so well a second time only. The clover often disappears to a great extent, especially if it has been fed very hard. Mowing sweetens the surface, and the next time, when it is generally reserved for the lambs, the bite is good, and sheep do well. There is a difficulty with the seeds on such land. Clover will not grow every fourth year. Too much ryegrass, especially Italian, is injurious for the wheat crop, and is not always good food, being inclined on good soils to rankness.

MR. RIDLEY'S SYSTEM.

A system is practised by Mr. J. Ridley, of Damerham, Salisbury, which is worth notice, as, if successful, it will remove the difference we at present labour under. His land is rather light on the upper chalk. He farms strictly on the four-course shift, and sows down 16lbs. of hop trefoil and 8lbs. of white Dutch; and once in twelve years he substitutes on this broad clover alone. The hop and Dutch are, I believe, principally, if not entirely, fed; the very different habit of growth being favourable, as the hop affords an early feed, and the second time, which is the most successful, the white Dutch is just in flower. I am informed, on reliable authority, that his lambs are very superior to any in the neighbourhood. The cost of such a crop is very small, not above 10s. an acre, and if as successful as he states it to be, it may well stand comparison with winter vetches, which certainly cannot be grown for anything like that sum; although there is no reason why we may not have both, as good roots can be grown after vetches. I should have feared that such a large quantity of white clover would have scorched the lambs. A careful system of close feeding would be the best thing to prevent this. In our own case we have found lambs thrive better on vetches than on seeds, and I have for some years weaned on vetches, leaving the ewes on seeds. This is open to objection. The customary practice is to leave the lambs where they are, and remove the ewes, or, as in Wiltshire, leave both, and merely separated by a double line of hurdles. If by the use of sties, either pulped or long, we can increase our winter keep in anything like the proportion I have named, we shall want both seeds and vetches to carry us along through the spring and summer.

WEANING AND DIPPING.

Early weaning will be found generally desirable towards the second or third week of May. Lambs that drop in February will then do best without their mothers. As soon as possible after weaning they should be carefully dipped. Biggs' dipping trough and composition are both excellent. We should dip twice or thrice during the season; the outlay (under 2d. a head) will be well repaid in improved health, freedom from irritation, and so forth.

Change of food is desirable for lambs; hence vetches and clover can be alternately fed, rape and vetches mixed, and then rape, which may be got for August; early turnips and rape in September. Sainfoin is also very valuable as a change. On regular breeding farms, especially when the climate is against winter feeding, lambs should be sold in the autumn. They will often make a comparatively higher price than if kept through the winter and fattened. There will always be plenty of buyers, because so many farms are unsuitable for breeding. It is probable also that fattening sheep in yards will be more common when the profitable character of the system as compared with feeding cattle has been more fully demonstrated. Some time ago a paper was read at the Central Farmers' Club by Mr. Easton, in which that gentleman stated that six lambs tread as much straw into manure as a beast; that one acre of mangold kept 25 sheep from December 1st to April 15th; and that he made his mangolds pay £12 11s. 2d. per acre, and the hay and straw 8s. a-head. Hence we may look for an increased demand for good stock tags, such as according to the kind of feeding we have sketched out ought to be produced. With regard to the proportions of food for say 200 fattening and 100 store tags, the summer keep would consist of clover, vetches, and sainfoin, and they should be always folded, and the sheep changed as frequently as possible. For August we must provide 8 to 10 acres of rape and vetches. A most excellent mixture is one bushel of vetches and 2lbs. of rape and clover hay; a tie of clover in the morning, and a tie of rape in the afternoon, when their bellies are full. Hay and 4lb. of corn from September 1st to October 15th, and 10 to 12 acres of rape planted at two or three times. From the middle of October to Dec. 1st 10 acres of turnips cut for fattening sheep. From December 1st swedes: a good crop will last the 300 sheep one week. By Christmas increase the corn to 4lb., and later on to from 4lb. to 1lb. Lambs, when first fed on the roots, are sometimes affected with scour of a peculiar character, and die off very suddenly. In these cases the roots are generally fleshy and growing. The sheep have abundance, were probably poor when put on, and appear to be doing remarkably well. The cause of death is spoplexy, or making blood too fast. The blood becomes thick and unhealthy, and the animal dies. Corn, given injudiciously, will produce the same result. If the sheep are supplied with corn undiluted with chaff early in the morning, when the belly is empty, it will eat ravenously, and suffer accordingly. Chaff is a diluter of corn is so valuable that some old shepherds consider a pint of corn with a pint of chaff equal to one quart of corn given alone. Chaff, with roots, if the application could be economically carried out, would undoubtedly be far better food, especially during the depth of winter, than so very large a quantity of roots. In the very brief sketch which the time allotted enables me to make, you will observe that I have not touched upon several matters of some interest and importance. For example, the value of the different breeds of sheep is in itself a most comprehensive topic. I will say no more, however, than thank you for the attention with which you have listened to my observations (loud cheers.)

LORD BERNERS: I am sure the meeting will be of opinion that most of the suggestions that we have heard from the Professor are of the highest value and importance. Speaking from my own experience, I can state that I have for many years carried out what he has recommended with respect to dry food, both for cattle and sheep. I have found that when I reduced the quantity of turnips given to bullocks and sheep, and supplied them with a certain proportion of cut straw, they have done a great deal better than they did before. Very frequently I have seen an ignorant common labourer giving his bullocks as much turnips as they would eat, whatever the condition of the cattle at the time. One day I went into the yard I found twenty or thirty bullocks tied up and shivering dreadfully. I asked the man in attendance what was the cause

of this? and he replied, "Oh, yes, they always be so after eating so many turnips." I at once ordered the quantity of turnips to be reduced, and gave the animals dry food, and there was no more shivering afterwards (Hear, hear.) With regard to cutting hay and straw I do it entirely by steam. I pulp the roots at the same time, and experience the greatest advantage from it. Mr. Coleman has alluded to the couples depending very much on condition, and this I found to be the case a great many years ago. When residing in Norfolk, I had about a thousand ewes on the high lands, and we were short of food; but happening to have some coleseed on the land which I had brought into cultivation, I sent the thousand ewes to feed upon it, and we had not only a greater number of lambs than before, but ewes, as the shepherd said, ran about thirteen or fourteen days, when, generally speaking, they would have been about a month. The cole seed has a particular tendency to bring the ewes into use. As to lambs I have taught now the habit of eating artificial food before they are weaned, because there is otherwise a difficulty in inducing them to eat it at the time you wean them. Though I give them a small quantity, yet by that means I keep them in good condition until the cold weather comes. In my neighbourhood it is not the practice to give lambs artificial food until the cold weather arrives, and I have seen them half-dead, and hardly able to move; but the instant you give them this stimulating food they die off more rapidly than before. I think, then, it is of the greatest consequence to give all stock their food, and keep them going on, with the view of preventing them from getting into that state of cold which is so prejudicial to them. I think that Mr. Coleman's observations upon the different kinds of straw are also very valuable: and here I may mention a fact, which some of the gentlemen now present may remember. Some of you may recollect how successful Mr. Grantham was at the Smithfield Show thirty years ago with his Southdowns. I visited him on several occasions before this Society was established, and I found his ewes in the yard in the winter, supplied with nothing but pea-straw; and he assured me that that kept them healthier than they would be in any other way. Well, I tried the system, on a small scale it is true, because I grew very little peas; but it proved to be so beneficial, that I have almost invariably kept a stack of pea-straw since, and given it to the ewes when they were lambing. The Professor has also referred to bean-straw. Now two or three years ago, when there was a great deficiency of fodder, he had never used bean-straw, having been informed that it was likely to cause gripes. I was told, moreover, that it was not good for cows, because it would dry up their milk. I then had the bean-straw cut and steamed, and I certainly never found my horses, cows, and other cattle do so well on any mixture of straw and hay as they did on that of bean-straw so cut and steamed. I lay great stress upon it being steamed, because it is otherwise so hard. I do not think that during the short time it remains in the animal's stomach so much nutriment can be abstracted from it as when it is half digested by steam. I would now beg to offer the Professor the best thanks of the Society for his excellent lecture (Hear, hear).

Mr. HOLLAND, M.P., had tried a mixture of chaff and cut hay with roots referred to by his friend Mr. Coleman, and had experienced all the economy in the consumption which that gentleman had mentioned. There was one point, however, in which he could not agree, viz., that the more corn they would give the sheep the better it would be. For his own part, he would rather have a mixture of chaff and corn together; for he believed that it was absolutely necessary for the digestion of sheep, as it was for that of a cow, that the animal should be filled, though not entirely, with nutritious food; but when the stomach was full, then came the mechanical process of digestion. Now if they gave more food of a nutritious character than was requisite for the nutriment of the animal they wasted their previous food, that which cost money; whereas if they gave a sufficient proportion of food for nutriment and added the bulk which was necessary for the mechanical process of digestion, they acted in a more mechanical manner, and did the animal a great deal more good. With regard to what Lord Berners had said respecting the management of lambs, he (Mr. Holland) managed his lambs in such a way that they did not know when they were weaned. The method in which he fed off artificial grasses, clover, or anything of that kind—not roots of course—with ewes and lambs was

by having a pen folded off for the ewes to run into, with gates in the pen that contained each lamb and ewe. The lambs ran through the gate and had the first cropping of that which the ewes would have to take to, and upon which was the dust of cake, or something else which the lambs took to quietly; so that by the time they were to be weaned they had no objection to leave off their mother's and resort to the food to which they had thus by degrees become accustomed. He should like to know a little more about the experience of the profession with regard to nets. He supposed, however, that the use of nets by way of saving hurdles was more or less applicable to one breed of sheep rather than another. But with his own breed he found that the nets were continually giving him trouble; for the animals were caught in them and sometimes injured, whilst, being in a game country, the nets were so bitten by hares that the sheep could get their heads in, and were consequently more liable to accident. On the whole, therefore, he was inclined to prefer hurdles.

Sir W. MILES, M.P., had very great pleasure in joining in the expression of thanks to the Professor for his admirable lecture, in which every flockmaster in the kingdom was nevertheless interested. It gave them not only the theory but the practice that was followed at Cirencester; and it was both a history of the breeding and a history of the feeding, and conducted the lamb through every stage from the period of its birth till it became a full grown teg. Than that nothing could be more practical and useful; and although weaning time was now almost gone by, farmers with land like that which was attached to the Agricultural College at Cirencester would now know what was the best way in which to treat their flock up to the end of winter.

Mr. DENT, M.P., observed that, as the Professor's observations had treated almost exclusively of sheep in the southern and south-western counties, he would take the liberty of making a few remarks with regard to the system of rearing them in Yorkshire. In the north they did not get their lambs dropped until the latter part of March or the beginning of April; therefore the weaning time this year was yet to come, and it was usually in July and August. Upon nearly all farms where there was old grass land it was a rare thing to run the ewes in lamb upon turnip land; and speaking from his own experience, he should say that, as a rule, it was not a good thing. In fact the winter before last his ewes had no turnips until after lambing; and although his shepherd was exceedingly anxious that they should have some, when lambing time came he was compelled to acknowledge that he had never known a healthier season. Last year they ran for the greater part of the year upon old grass land, and had a few turnips carted to them with a certain amount of corn and cake. There was great difficulty in managing a flock of ewes upon strong land. One or two years he had suffered severely from scour in lambs, and that was always the result when by accident he was tempted to put them back in the clover field. During the two last seasons he had found the best plan for keeping them free from scour and in a healthy condition, was to place them upon old grass land, which had not been stocked with sheep through the previous part of the year. From the old grass land he put them upon white mustard, either by itself or mixed with rape, a remarkably healthy crop for young lambs, which would eat the young mustard upon its coming into flower before they would touch the rape. He could not help thinking that the system of folding mentioned by the Professor must be a good one; but it was not carried out that he was aware of anywhere in the north. Some time ago he read a paper by Mr. Bond, of Suffolk, upon the management of breeding flocks of ewes upon strong land, which impressed him very much, and he thought it would be a good plan to follow out in the north. The practice of folding in summer was not known in Yorkshire. There, too, a hurdle was scarcely ever seen, and they suffered much from game. When nets were used they were bitten in holes by the hares, and took a good deal of mending. The sheep were, therefore, left to run over the seed field. He recollected some endeavouring to fold ewes and lambs in mesh; but that year two lambs got hung in the nets, and he had known a case or two of tegs or full-grown sheep hanging themselves in the same manner; that, however, was not frequently the result. With regard to the comparative merits of nets and hurdles, he was not competent to speak positively, for he had never seen hurdles tested. It was important to know what could be substituted for clover

in the case of a flock of breeding ewes. In the north great difficulty was experienced in growing clover once in four or even five or six years, and he should be glad to see his way to the adoption of some rotation, such as tares or vetches. The idea of vetches and rape together for feeding off seemed to be a very good one. In the East Riding it was a common practice to take a portion of land that ought to be in clover and sow it with vetches, eat it off early, and then take rape after the vetches. As to ewes producing pairs of lambs, he might mention an interesting fact. Last year he wanted some additional sheep, and purchased 45 Leicester ewes, of capital quality and in excellent condition. After he had them he put them with his other ewes upon rape and white turnips with the same rams; but out of the whole 45 nearly 30 were barren, and he attributed this to the fact that he did not keep them so well as they had been kept by their former owner, and that consequently they had fallen off in condition when put to the ram. In this opinion he was confirmed by the fact that the great proportion of the remaining 20 or 25 ewes bore double and treble lambs from the same rams. That appeared to corroborate the view of Professor Coleman that the ewes should be in an improving condition when put to the rams.

Mr. P. FISHER believed that malt chives given to the ewe flock would induce them to eat much more straw in mild seasons than they would otherwise be inclined to take. His practice from the first was to give his lambs all the appropriate artificial food that they could be coaxed to eat; and when the rapid growth of the lamb compared with that of the other breeds of animals, and the speed with which it obtained the stature of its parent, were observed, it would be seen that it was particularly adapted to be fed well from the outset.

Lord BERNERS asked Mr. Holland if he had ever used cocoa-nut matting for his folds?

Mr. HOLLAND replied that he had done so, but had not given it a fair trial. He was quite satisfied with the trial he had given the common nut.

Lord BERNERS had himself put down cocoa-nut matting, but found it eaten through by the sheep in innumerable holes in the morning.

Mr. FISHER HOBBS said that the system which Professor Coleman had propounded that day so much coincided with his own practice in the management of a Southdown flock, that he would trouble the meeting with very few remarks. He believed it was a very profitable system upon the light lands in an open country, and might be followed out with great advantage. It enabled the farmer to produce mutton and lamb of early maturity, and the flock might be managed under it in a manner very superior to the system adopted in the northern and midland counties. Indeed, a stockmaster might keep from two to four sheep per acre, and if it were good grass land a certain number of beasts, and thereby make a better return than in any other way. In his district nothing paid so well as sheep-feeding on a high system in the manner recommended by Mr. Coleman. He should like to know, however, in what way the washpool was to be used? Of course, it could only be at a period of the year when the ewes were not in a state of gestation or course of breeding, and could only be required during the summer months. Swedes had been recommended after lambing time. But some years since a friend of his, Mr. Edwards, of Sutton, Suffolk, who kept a large flock of sheep, having lost a large quantity of lambs before they came to maturity owing to washing, wrote to him (Mr. Fisher Hobbs) for his advice in the matter. In answer he put several questions to Mr. Edwards, the first of which was, "Did you feed your ewes on Swedes before lambing time?" To which enquiry Mr. Edwards replied that he did, and that he had lost 100 lambs. The use of rape for lambs in the summer months was very important. Within the last fortnight he had lost 10 or 12 acres of coleseed entirely through the drought. The

field had contained winter oats and vetches, and sheep and lambs had been feeding upon it with abundance of oilcake; it was well ploughed, but when the seed came up the recent excessive drought destroyed the whole piece. In his neighbourhood, especially on such land as he occupied, they depended much during July and August upon the early dwarf rape, which he believed was not commonly used. He had had his from Dorsetshire, and it had turned out to be of very great value. He sowed it eighteen inches apart, and harrowed it frequently, and in eight or ten weeks it made the best and most fattening food for sheep that he had ever met with at that particular time of the year. In the present day, a joint of lamb or mutton was to be seen upon the table on every public occasion, and it was necessary to encourage the breed of sheep even more than any other animal. It was unfortunate, however, that in the course of the last three years, as Mr. Coleman had shown, the number of sheep in this country had greatly diminished, although the population had gone on increasing all the time with gigantic strides.

Mr. HOLLAND said his friend, Mr. Coleman, had alluded to the dressing of sheep. Now, in Lincolnshire, there had been, he understood, a great mortality amongst the sheep, owing to the attempts which had been made to cure the scab in particular by means of mercurial preparations, which were generally used in the form of an ointment. This ointment had the effect of shutting up all the pores of the skin, but not until the mercurial properties had had an injurious influence upon the health of the animal. Scores of sheep had died from this cause, and after death it had been discovered that where the mercury had entered into the system the meat was bad for human food. It stood to reason that, if the pores of the skin were stopped over the whole surface of the animal, that which ought to escape from the body—such as carbonic acid gas—would become mixed with blood, and the whole system be deranged. Not only that, but the organic particles which ought to escape from the animal in order to its remaining in a perfect state of health, were retained, and also driven into its system. Now, this ought to be guarded against by farmers; and he was glad to hear from the Professor that the proper dressing ought to be given in a liquid form, and not as an ointment. Analogous to filling up the pores of the skin of the grown-up animal with ointment was that system which caused a great mortality of lambs every year, namely, of covering the lamb which had lost its dam with the skin of another lamb. In the same way this practice stopped up the pores of the skin, and produced a diseased and unhealthy animal, if not its loss by death.

After a few words from Mr. Barker,

Professor COLEMAN briefly replied; and in allusion to the subject of nets, said they were not used on the College farm, owing to the fact that much of the land there was exceedingly shallow, the soil being only three or four inches in depth, so that they could not keep up the nets with stakes. Nets, however, where they could be used, offered the great advantage of easy removal. Of course, the existence of game in large quantities would constitute a fatal objection to nets; but that, he believed, was an exception rather than the rule. As to the size of the mesh, that might be easily altered. If the sheep were of such a size that their heads would get through the mesh, all that was required was to make the netting smaller. The sheep on the College farm were principally Cotswold, and they answered exceedingly well. There was some trouble at first, and care and patience were necessary; for the labourers were sometimes so prejudiced against any alteration—and farmers, too, for that matter—that they would not give a new food or a new system a fair trial. With regard to the washpool, he did not think its use need be restricted in all cases to the summer; on the contrary, he was of opinion that ewes, up to the period when they were half gone in lamb, might be washed in the winter.

The meeting then separated.

OUR IMPORTS AND EXPORTS.

The subject of our foreign trade has lately been under discussion in several quarters. The British Association, the Society of Arts, and the Statistical Society have all been reviewing the course of our external trade for the last ten years. From the Journal of the last-named society and the annual Customs Report just issued we glean some important details, which are deserving of a place in our columns. Although great modifications were made in the English tariff in the ten years from 1841 to 1851, very considerable remissions and reductions of duty have been effected during the ten years ended with 1862; and two of the greatest commercial changes, the repeal of the corn laws and the abolition of the navigation laws, although adopted shortly before 1851, have influenced very considerably the commerce and condition of the country in the period under consideration.

Less importance is generally attached to the opening of our trade to foreign vessels, than to the repeal or reduction of a duty upon some important article of consumption. But an unrestricted command of tonnage is an essential element of an extensive foreign trade, and the abundant and cheap supply of the natural market is greatly dependent upon free navigation.

The repeal of the corn laws is undoubtedly the most important of our tariff alterations. Whether in its direct operation in augmenting the supply of the chief article of food, or in its indirect effect upon the extension of manufactures and trade, no change of duty can bear comparison with it. The large importation of wheat and flour in every year since the repeal of the sliding scale of duties is a proof that the demand is not altogether dependent upon the supply of home-grown corn, which is well known to have been much increased of late years.

The variation in the quantity grown at home affects the demand for foreign corn; but it is nevertheless a question whether the consumption of foreign corn does not, as a rule, depend more upon the power of the people to purchase, rather than upon the fluctuation in the yield of home-grown corn. Large supplies of foreign corn are sometimes looked upon as a drain upon our resources, but they are frequently an evidence of the soundness and largeness of the means of the people. Large importations of foreign corn are generally coincident with large exports of British productions.

The very considerable increase in the consumption of foreign wheat and flour since the repeal of the corn laws, and the very large annual value of that comparatively new article of foreign supply, are important proofs of the increased prosperity of the country. From 1831 to 1840 the average annual consumption was 900,000 quarters, and the value at the average price of British wheat was £2,520,000. From 1841 to 1850, the average consumption was 2,600,000 quarters, and the value £6,890,000. From 1851 to 1860, 5,000,000 quarters were consumed, of the value of £13,500,000. The real value of imports was not ascertained at the Custom-house before 1854. In the eight years from 1854 to 1861, the total value of foreign wheat and flour retained for consumption in the United Kingdom amounted to 122 millions sterling, or about 15½ millions upon an annual average.

The imports of corn last year reached 16,875,192 qrs., and of flour 7,225,048 cwts., as against 14,279,052 qrs., and 6,250,359 cwts. in 1861. The supply of wheat and wheat flour from the United States of America alone was 3,724,770 qrs. and 4,499,582 cwts., which is one-third

more than it was in 1861, and double what it was in 1860, thus very opportunely making up to us the deficiency which since the year 1859 has been found in the imports from France of those most necessary articles of consumption.

A review of the commercial policy and trade of the last ten years shows that much progress has been made during the period, and there are good grounds to expect greater progress in subsequent years. But it is vain to expect that commerce can be one-sided, or, in other words, that there can be larger exports without corresponding imports. The progressive wealth of a country is often supposed to depend upon progressive exports. To foster national productions for the supply of both home and foreign markets, has been the great aim of statesmen in many countries, and is still so in some countries. The commercial policy has been to send any and everything abroad, but to receive nothing in return that can be produced at home, however indifferently, or at whatever cost. How can exports increase if such a policy prevails with regard to imports? If countries are to be generally adverse to receiving foreign imports, where are markets to be found for exports?

If reasonable facilities are only given to commerce, its future extension in all countries must be very great. How comparatively small a number of the world's population can as yet be reckoned as average consumers of the common necessities of life. An anti-commercial policy, imperfect means of communication, and generally low rates of wages, have, in almost all countries, restricted the power of consumption of the people to the most moderate scale. Each of these serious obstructions to the welfare and progress of nations is, happily, disappearing. Restrictions of trade and difficulty of transport conduce to the state of isolation which is inconsistent with the due advancement of national power and influence. The improvements in means of communication are contributing to a great increase in the productiveness of countries, and are affording extraordinary facilities for the extension of international trade. But how comparatively useless would be the great lines of railway connecting state with state, and traversing Europe from end to end, and the rapid intercourse by steamers upon every sea, if the interchange of merchandise continued to be paralyzed by the exaction of exorbitant duties?

Of late years the commercial policy of England, as a general rule, has been based simply upon the interests of her own people, and without having recourse to commercial treaties. This is no doubt the best principle; but, as there are admitted exceptions to all rules, if the Governments of foreign countries prefer, or are obliged to proceed upon a different system, we must hope that they will, at all events, make good progress towards greater freedom of trade. England, having relaxed her tariff for the produce of all countries, is supposed to be in an unfavourable position as regards countries which do not grant to English produce the same advantages as to the produce of some other countries. But true principles of policy will prevail in the end, and public opinion will overcome the obstacles raised by special interests.

As regards the aggregate trade of the United Kingdom between 1851 and 1860 very favourable results are exhibited, in comparison with the preceding period from 1841 to 1850. The average annual value of imports at the old official fixed rates, an indication of quantity rather

than of value, was 82½ millions from 1841 to 1850, and 130 millions from 1851 to 1860. The per-centage increase in the period from 1841 to 1850 over the preceding ten years was 53 per cent., and from 1851 to 1860 over 1841 to 1850 it was 57 per cent. The net value of the total imports when first ascertained in 1854 was 152½ millions, and in 1861 it was 217½ millions, showing an increase in the eight years of 43 per cent. Last year the increase was still larger, the net value of the imports having reached 326½ millions. A comparison of the total declared net value of British produce exported exhibits still more favourable results. The average annual value of the exports between 1841 and 1850 was 57½ millions, and 106½ millions between 1851 and 1860. In

the period from 1841 to 1850, as compared with the preceding ten years, the increase of British exports was a little over 12 millions, or 27 per cent., and from 1851 to 1860 the increase upon 1841 to 1850 was as much as 49 millions, or 85 per cent., which is more than three times as great a rate of increase as in the preceding decennial period. This is an important fact, and it may be urged as strong evidence in support of the principle that the exports of a country cannot be increased to any considerable extent if the imports are restricted by high rates of duty. The commercial policy pursued in England of increasing imports by repealing and reducing customs duties has certainly been followed by a surprising extension in the exports of British productions. S.

FOREIGN AGRICULTURAL GOSSIP.

We have examined, in some detail, several of the district State agricultural meetings held this year in France, but others of the series still call for notice. The next meeting on our list is that held at Nîmes, a town which has every year an exhibition of fat stock, and which, in 1863, has, besides, been the scene of a show of reproducing animals and agricultural machinery for the Mediterranean district. This locality comprises nine departments, viz.: The Var, the Bouches-du-Rhône, the Gard, the Hérault, the Aude, the Pyrénées-Orientales, the Vaucluse, the Alpes-Maritimes, and Corsica. It does not want a certain homogeneity, although the most varied cultures dispute the possession of the soil. The vine, the mulberry-tree, the olive, the almond-tree, and madder leave little space for the production of cereals; herbage is completely deficient, and sheep are the only kind of stock suited to the region. In the southern part of Provence roses and aromatic plants are cultivated for perfumery; but the plant which is gradually dominating over all others is the vine, which has been invading all the lands devoted to mulberry-trees, since a disease which has prevailed among silk-worms inflicted a sad blow on silk industry. The land of the district is far from having everywhere the same value. In the valley of the Rhone especially, in the language of M. de Lavergne, extreme poverty is bordered everywhere by extreme wealth; by the side of lands which are worth £200 per acre, others occur which will not realize £2 per acre; in fact, it is a country of contrasts. Notwithstanding, as will be gathered from these remarks, that the district is far from rich in large cattle, the Nîmes Exhibition comprised 153 beasts, divided, as to origin and breeds, as follows: Pure French, 60; Durham, 9; pure foreign, 45; Durham crossings, 18; various crossings, 21. The total of pure French breeds was constituted by animals of 10 or 12 different races. This formed a rather discordant *ensemble*, but one must not be severe upon a district where the rearing of beasts is a perilous operation, where there is a good deal of groping in the dark on the subject, and where it is besides impossible to lay down absolute rules, the employment of different breeds depending solely on local circumstances. In the neighbourhood of a great town it is an advantage to have good milkers in consequence of the high prices which milk realizes, and two of the exhibitors at Nîmes, from the environs of Alais and Montpellier, have carried out this principle, having shown very fine specimens of the Bazadaise breed. Apart from this particular case, however, the rearing of milking breeds is an onerous affair; and breeds, regarded with favour by the butcher, are also comparatively unsuitable, meat sometimes costing more to produce than it returns, having regard to the high price of forage. Breeds suited also for working purposes can alone be utilized without loss in the south of France; and such is the opinion of M. de Marion-Gesle, who, after several experiments, has adopted the Bazadaise breed with this object, and finds it answer his purpose very well. The original tribe of the Camargue met with some success at the Nîmes Exhibition: it is still a savage race, standing high on its legs; but, as a

whole, it is tolerably well looking. The animals shown by M. Sabathier-d'Espéran were especially much remarked; but it remains to be ascertained up to what point the rearing of this breed in a tame state may be economical. A special category was devoted to Durhams; but of nine shorthorns which figured in the catalogue only seven appeared; they all belonged, with one exception, to M. Sabathier-d'Espéran, and received second prizes. The category of pure foreign breeds comprised thirty of the Schwitz race, eight of the Dutch, six of the Ayr, and one not particularly specified. The best animals of the Swiss breed belonged to M.M. Gaston, Basille, and Destreux. M.M. de Cassaigneau, de Brasse, and Causse exhibited fine specimens of the Ayr breed. In Durham crossings the palm was allotted to the Duc de Fita-James, for a Durham-Manuelle heifer and cow, which were both of considerable excellence. The miscellaneous crossings presented few striking subjects, the majority of breeders proceeding at a venture, commingling races without clearly considering beforehand what kind of mixture can result, and without often knowing exactly what it is which they wish to obtain. Nevertheless, it is desirable that this class should be maintained on the programme, as it leaves the door open for all possible ameliorations. The sheep classes comprised 445 head: viz., 96 Merinos and mixed Meriner, 76 Barbarines, 68 common-wooled breeds, and 205 various crossings. The category of various foreign breeds contained no entry, but the show of sheep was satisfactory as a whole. The Barbarine breed is a precious one for the south; it sustains the heat well; it shows itself very unexacting as regards its choice of food, and, above all, it has the merit of being very prolific. Unfortunately, however, its improvement offers great difficulties, all crossings hitherto attempted having yielded only insignificant results. By the common-wooled breeds is meant the Lauraguaise, the Narbonne, the Causse, the Larnac, &c. The utility of Southdowns in the south of France is still a matter of dispute; some breeders are making a trial of them at this moment, and it will soon be practicable to come to a more general and decided conclusion on the subject. The Department of Agriculture has provoked this result, and, at the Nîmes show, reserved eight prizes to Southdowns, which were gained by M.M. de Cassaigneau, de Brasse, Fabre, Sarda, &c. The miscellaneous crossings left much to desire. The pig classes reflected the fact that that class of animals is still far from numerous in the south, their meat not being particularly adapted for food in a warm climate. English reproducers have, however, been employed with good results. It seems desirable to reserve a notice of the Vaucluse Meeting to a future occasion. There will still remain for examination also the Rennes, Valence, Auch, Nevers, Chambéry, &c., meetings; but we hope to pass them all under review in due course; for, as was remarked a week or two since, they throw valuable light on the agricultural progress of their respective districts.

Exhibitions of various kinds are all the rage just now in France. At that just held at Lille, to which reference has been made under other heads, M. Cornuaz, Counsellor of State, and Prefect of the Somme, assembled a collection of

forage plants, suitable for consumption by stock of various kinds. Dr. Antier, of Amiens, sent to "the International" last year a collection of the industrial plants of that district, and it reappeared at Lille, with statistical information. To show the importance of these kinds of exhibitions, accompanied by useful explanations, it may be stated that the department of the Somme alone comprises from 190,000 to 200,000 acres of either natural or artificial prairies, and that the annual production of this forage represents a capital which is estimated at no less than £1,000,000. The Agricultural Society of Niort offers again for competition the publication of the agricultural almanack, for which one Jacques Bujault established, by will, an annual prize of £24. The prize not having been awarded in 1863, will be increased to £48 for 1864. It is an indispensable condition that the almanack should be published in the department of the Deux-Sèvres; and M. Bujault stipulated also that his almanack should not be confined only to strictly agricultural matters, but that criticisms on manners and morals should also make it animated and readable. "To attack bad habits and bad morals," wrote worthy M. Bujault, "is one of the principal objects of the prize which I have founded. I know that of all men the most vicious is the most unhappy, and that he who has economy and temperance, and who loves work, has wholesome ideas, and will always be an honest man."

In imitation of many other departments, and on the occasion of the great agricultural show of the district, the department of the Côte d'Or recently devoted a small allocation to the organisation of an exhibition confined wholly to horse stock. The programme offered 30 prizes, of a total value of £220, together with medals of gold, silver, and bronze, intended to render the certificates of merit given authentic and durable. Of this sum, however, more than £72 remained unemployed, subjects having altogether proved wanting in some classes; while as regards light horses and carriage horses, the jury found them too inferior to justify them in awarding prizes. The category of draught horses was a little better filled; nevertheless, the list of competitors comprised only 100 entries altogether, stallions, mares, colts, and fillies included. This was little enough for a district composed of seven departments, and the horse "population" of which has attained the considerable total of about 350,000 head. The Côte d'Or has applied itself for forty years to the improvement of its horse stock, and has adopted the same means and the same systems. This is an example of sustained perseverance very rare in France; for, although in its details the system has exhibited variations, it has remained firm as regards its basis—the employment of horses of heavy draught. The horse population of the department was very small about 1824, when attention began first to be directed to it, and it was especially poor in quality. It responded in every respect to the scarcity of forage which prevailed in the district, in which natural prairies were comparatively limited in extent and confined, if indeed they were not altogether unknown. The means of communication which existed at this period in the department were—as was indeed the case all over France—very defective, and the harness and agricultural implements of all kinds were very heavy and cumbersome. The kind of horses which prevailed with such a state of things may be readily inferred, and those of the Côte d'Or were no exception to the common rule. Sorry and without value, they were found everywhere, as regards height, corpulence, and value, in the exact ratio of the cause to the effect. In such circumstances breeding had little activity, and was confined within the most circumscribed proportions, from which no success was obtained. This was the case with the Côte d'Or, which then borrowed from elsewhere a portion of the horses required for its wants. Has the stock of horses which the department now possesses become passable? M. Eugène Gasot, a very outspoken *littérateur* on such subjects, replies both in the affirmative and the negative—yes, for a part; no for the rest, especially in presence of the exigencies of the times. M. Gasot, regarding the matter as a whole, does not consider that the Côte d'Or occupies a higher place than formerly on the hippic scale of France: the general level has risen, and the Côte d'Or appears to have only preserved its old relative rank. Although official documents issued on the subject intimated that the Dijon Show was organised to indicate the progress which had been made by the district in improving its breeds of horses during the last 40 years, M. Gasot declares unhesi-

tatingly that the exhibition was a poor one, and very inferior to corresponding meetings held in 1861 and 1862 at Charleville and Givet. Well, it is something to have a bold and unsparing critic!

THE NORTH-EAST AGRICULTURAL ASSOCIATION OF IRELAND.

The premium sheet for the summer show of this thriving association has just been issued, and on looking over the twenty-three pages which it occupies one would almost be led at first sight to suppose that it was the premium sheet of a "royal" society, and not that of a provincial association. The amateur classes, together with the competition for the different challenge cups, with one exception, are open for universal competition, the only exception being that of a 20-guinea challenge cup, with 5 sovereigns added yearly for three years, for the best bull calved after the 1st of January, 1859, and which is only open for competition to the tenant farmers of the county Down. The open cups are (1) the late North-East Agricultural Society's challenge cup, value 50 sovs., with 10 sovs. added yearly for three years, commencing in 1862, for the best thorough-bred weight-carrying stallion; (2) a challenge cup, value 25 sovs., for the best stallion in the classes of horses suitable for agricultural purposes; (3) a challenge cup, of similar value, for the best animal in the short-horned classes; (4) a £20 challenge cup for the best animal in the Ayrshire, polled, and Devon classes; (5) a £10 challenge cup for the best pure-bred ram; (6) a similar challenge cup for the best pen of five pure-bred ewes of same breed; (7) another £10 challenge cup for the best boar; (8) another, of like value, for the best sow; (9) and another, also a £10 cup, for the winner of the greatest number of first prizes in the poultry classes. Besides these cups, there are also silver medals and special prizes for the best bull, the best cow or heifer, best ram, best boar, and best sow. These are irrespective of the different class prizes. Flax and flaxseed also form a distinct class, and accommodation will be given for implements, although prizes will not be awarded for such. There are also premiums for the best-managed farms in certain baronies in the counties of Down, Antrim, Armagh, and Monaghan, the working farmers of those counties having a separate and liberal share of the premiums allotted to them.

Opening the amateur classes to general competition has worked well so far for the association, and we expect that the show on the 9th and 10th of July will continue to prove that it was a wise measure. It has given us much satisfaction to see a large accession of members invariably announced at each committee meeting of the association, and that not only of parties resident in the north-eastern counties, but of gentlemen belonging to other parts of Ireland. The North-East Association has been from the first a success, and one great reason of this is, unquestionably, the large practical element which it contains in its executive; for while the list of vice-presidents contains the names of a number of noblemen and gentry who have been identified with agricultural improvements in the north, the committees for the different counties are composed in a great measure of practical farmers, and of gentlemen who have made practical agriculture their especial study. This is the great secret of success in all such associations, and failure inevitably follows its neglect.

We understand that the leading railway and steam-ship companies are granting very liberal terms, many of them agreeing to convey the live stock and machinery of exhibitors to, as well as from, the show free of charge.—*Irish Farmer's Gazette*.

WHAT IS A "STONE" WEIGHT?—A stone, horseman's weight, is 14 pounds; a stone of butcher's meat, 8 pounds; a stone of iron, 14 pounds; a stone of glass, 5 pounds; a stone of hemp, 32 pounds; a stone of cheese, 16 pounds. Clear and simple certainly!—*BUILDER*.

CALENDAR OF AGRICULTURE.

Sow turnips as directed last month, and late in some places, in order to avoid the fly and the mildew, better than the early seasons. Horse and hand-hoe potatoes, beet, and the earliest sown Swedish turnips, and continue the processes, that no weeds appear. The miniature plough of iron surpasses all drill scarifiers yet known; the pointed share penetrates any stiff lands beyond any scuffler, and raises fresh soil to exhale moisture to be imbibed by the young plants, two furrows being raised, works the land in an inferior manner, and cuts the weeds from the root. More time is required than by the scufflers; but true economy consists not in getting things cheaply done but well done. Two small ploughs of timber may be joined together by slant bars over the beams, and drawn by two horses; lay a furrow from each side of the ridglet, and are superior to any scuffler yet known. The scuffling may follow the ploughing of the intervals, and is very beneficial in dry weather, by raising moisture to be imbibed by the young plants.

Get on with the working of clay lands for wheat fallows, by ploughing, harrowing, and rolling. Pick off every weed and stone, and get ready the dung and lime that is intended to be applied.

Proceed with draining, both on grass lands and on fallows. Finish the latter as quickly as possible, in order not to impede the working of the land. Draining is best done on grass lands in neatness and cleanness of execution. The proper course of all drains should be marked in winter, when every wetness appears.

Wean the latest lambs and give them the best pasture. Put mares to the stallion regularly.

Attend that the pasture fields have a supply

of water, and that no gaps are continued in the fences.

Apply the contents of the dredging-box over the bodies of the sheep to prevent the maggot-fly depositing its larvæ. Dress clean the posterior parts of the animal from the adhesion of excrements.

The hay season will be finished this month—make hay and carry the grass quickly; build it into long stacks, lay it lightly together, and allow it to settle by its own weight. It is a mistake to tread it firmly together. Do not pull the sides of the ricks till well settled, then dress it into any form, and that without delay. To get up the hay to the rick when building, use a temporary scaffold raised on four upright posts, resting below on a four-wheeled platform, and elevate or depress the scaffolding by means of pulleys to any height that may be required. Lay some loose straw on the extreme top of the rick till it be thatched. When the hay is damaged by rains, mix salt in the ricks, as directed last month. When the building of the hay-rick is interrupted for one or more nights, spread over the rick a waterproof tarpauling cloth, to defend the rain; remove it in the early morning, to let the sweating of the grass escape. To defend the rick from day-showers, suspend over it a light cloth, by means of a rope passing the length of the rick, and attached at each end with an upright pole.

The grain harvest will commence this month in early localities. Early peas, barley, and rye will be first cut: tie the barley and rye in sheaves, and set them in shocks of twelve sheaves each, lay the peas in small heaps, and turn them frequently. Carry the grains quickly when dry, have rick stands ready, and barns cleaned out.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

In the earlier days, sow peas again, any short kinds; the crop may be fine, and therefore acceptable in September. Kidney beans, endive, and again in the third week: round-leaved spinach early, and the winter, or the prickly sort at the close of the month; turnip radish, turnips for succession, York cabbage about the middle of the month for colewerts; and about the end of the month, in several situations, for early hearting spring cabbage. Small onions to draw young, and on inferior soils a sprinkling of the large bulbs to stand the winter, and subsequently to be transplanted for an autumn crop.

Propagate herbs by slips, collect camomile flowers, transplant celery, the last crop.

The following operations are required at all seasons, while crops are growing. Stick peas or top

them, also broad and kidney beans, earth up legumens and potatoes; train and peg down the regular advancing shoots of vegetable-marrows, gourds, and cucumbers: hoe and move the surface among crops; give weak guano-water to plants of the cabbage family.

FRUIT DEPARTMENT.

Attend to the budding of wall fruit; learn the art from a jobbing gardener, who is easily found to do the work adroitly.

FLOWER GARDEN.

Layer strawberries at the first joint among dry loam in moist weather, and water the roots when dry.

Keep in neat order and free from weeds all flower borders, shrubberies, lawns, and walks, and remove rubbish of all kinds.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JUNE.

Although complaints were very general of the want of moisture in all our leading counties in the early part of the month, there was no difference of opinion in reference to the appearance of the wheat crop. Even on poor soils, it presented a healthy appearance, and gave promise of a large yield. Since the 14th, remarkably fine rains have fallen, and the wheats have progressed rapidly under the most favourable auspices; whilst, in some quarters, Talavera qualities have passed the blooming period. If, therefore, the weather should continue favourable, we may see new wheat in Mark Lane by the third week in July. Barley has wonderfully recovered from the effects of the late drought. It is now in full ear, and, apparently, the produce will be nearly, or quite, equal to last year. The rye crop has turned out well; and oats, beans, and peas have progressed steadily towards maturity. There is a great difference of opinion as regards the probable yield of the crops of the three latter articles; but our impression is, that it will amount to a fair average.

The quantity of hay likely to be carried this season will not be equal to 1862. The grass has grown with great rapidity of late; but, in too many instances, it has wanted bottom. As yet, very little has been carried; but a mild temperature may produce a larger second cut than in the ordinary run of years.

Owing to the backward state of the crops in the south of France, and a rise of from 1s. to 2s. per quarter in the value of wheat in the French markets, purchases of that grain to the extent of about 10,000 quarters have been effected in this country for consumption on the continent. Fine samples of both English and foreign have, therefore, improved about 1s. per quarter, and the value of other kinds has been well supported. For the time of year, our markets, taken collectively, have been fairly supplied with wheat, in good condition. In some counties, the stocks are almost wholly exhausted; but, in others, a fair quantity yet remains in stock and barn. As the harvest in France will be shortly in full activity, and as the crops are represented as looking well, we can hardly anticipate a continuance of the present demand for the Continent. However, from the circumstance that we have imported much less foreign wheat and flour than in the previous year, and from the stocks in warehouse being much reduced, we see no reason to anticipate a serious decline in the quotations.

With the exception of oats, which have given way 6d. per quarter, barley and all other kinds of spring corn have changed hands freely, at prices quite equal to those current in the previous month.

The potato crop is looking remarkably fine. In some quarters it is rather backward; but most of our correspondents state that there is no appearance of disease, and that the growth will be a very large one.

There has been an improved demand for both hay and straw. Meadow hay has sold at £3 to £4 10s., clover £3 10s. to £5 15s., and straw £1 8s. to £1 16s. per load.

The hop bine has made steady progress; but we learn that, of late, vermin has increased to some extent both in Sussex and Kent. The prospect is, however, that the growth will be equal to last season. Large quantities of foreign hops have arrived, and been partly disposed of, at moderate currencies.

Letters from America state that the supply of grain still in the hands of the growers is very large, but that the low rates ruling in this country have checked speculative shipments. As regards the crops, the pretty general impression appears to be that they will turn out well, although it is stated that the quantity of land under wheat culture this year is somewhat less than in 1862. Since the 1st of September, the shipments to the United Kingdom had amounted to 1,052,761 barrels of flour, 16,785,960 bushels of wheat, and 6,622,483 bushels of maize. Compared with the previous corresponding period, these figures show a falling off in flour of 770,816 barrels, and

of maize 3,978,682 bushels. In wheat, however, there was an increase of 1,276,276 bushels.

The accounts from Ireland are to the effect that the wheats are looking remarkably promising. All spring corn has progressed steadily, and the growers anticipate a full average yield. The potato crop, except in some few localities, was never more flourishing. The corn trade, however, has continued in a very unsatisfactory state; nevertheless, on the whole, prices have been well supported.

In Scotland, fine wheat has produced rather more money, and all other kinds of grain have commanded full prices. The grain crops are represented as in a flourishing state; whilst potatoes are forward, and mostly free from disease.

The wool trade, since the close of the last public sale, has slightly improved, but we have no advance to notice in the quotations. Very large supplies of wool have come to hand from Australia, and about 100,000 bales will, it is anticipated, be offered at public sale towards the close of July.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the Metropolitan, as well as the leading markets of consumption throughout the country, have been seasonably well, in some instances heavily, supplied with beasts, in good saleable condition, the demand for nearly all breeds has been somewhat active, and prices have further advanced. Really prime Scots and Crosses have realised as much as 5s. 2d. per 8lbs. The Norfolk "season" is now just closing. Compared with many former years it has produced a large number of very prime animals, and which have, no doubt, turned out very profitable to the graziers. Already nearly 500 beasts have arrived in the metropolis from Lincolnshire, but they have been of a character which does not warrant us in giving any positive opinion as regards the number and quality of future arrivals.

Sheep have continued to arrive freely, and the consumptive inquiry has ruled steady, at extreme rates to a slight advance. The best Downs have changed hands at 5s. 2d., and some very superior long-woolled sheep have produced as much as 5s. per 8lbs.

Lambs have shown less activity, and the currencies have had a drooping tendency. They, like the sheep, have appeared in really prime condition; indeed, we believe that less disease has been apparent amongst the stock exhibited than in most former seasons.

Calves have sold heavily, owing to the large supplies brought forward, and the quotations have given way considerably.

Pigs have been depressed, with a heavy sale.

The total supplies of stock exhibited in the Metropolitan Market have been as under:—

	HEAD.
Beasts.. ..	21,770
Cows	530
Sheep and Lambs	141,150
Calves	3,360
Pigs	3,110

COMPARISON OF SUPPLIES.

June.	Beasts.	Sheep & Lambs.	Calves.	Pigs.
1862	19,612	149,330	3,155	2,920
1861	18,240	144,500	2,578	3,860
1860	18,740	149,630	2,703	2,980
1859	18,958	159,650	2,967	2,152
1858	18,492	144,280	2,978	3,115
1857	20,063	108,480	2,404	2,123
1856	17,896	112,110	1,839	2,740

The imports of foreign stock into London have been on a full average scale; but, with the exception of some of the German sheep having appeared in somewhat better condition

than last year, the general quality of the arrivals has not improved. They have been composed of the annexed numbers:—

	HEAD.
Beasts	2,572
Sheep	20,032
Lambs	4,172
Calves	2,713
Pigs	567
Total	30,056
Same time in 1862	22,841
" 1861	32,751
" 1860	34,921
" 1859	18,875
" 1858	17,720
" 1857	13,551
" 1856	10,136

Advices from Holland are to the effect that the number of stock in process of fattening for the English market is rather extensive; and we are informed that the arrivals of beasts from Juliland during the remainder of the season will be very large.

The comparison of the receipts of beasts from our own districts during the month stands thus:—

	June, 1862.	June, 1863.
From Norfolk, Suffolk, &c ...	12,150	12,700
Lincolnshire	400	470
Other parts of England....	2,550	2,250
Scotland.....	1,400	690
Ireland	20	16

At the same time in 1861, the receipts from Scotland were 2,559, and from Ireland 8 head of stock.

The month's prices thus compare with the three previous years:—

	June, 1860.				June, 1861.			
	s.	d.	s.	d.	s.	d.	s.	d.
Beef from.....	4	2	5	10	3	4	5	0
Mutton.....	4	0	5	8	3	6	5	4
Lamb	5	0	7	0	5	0	6	8
Veal	4	6	5	8	3	8	4	8
Pork.....	4	0	5	2	4	0	4	10
	June, 1862.				June, 1863.			
	s.	d.	s.	d.	s.	d.	s.	d.
Beef from.....	3	0	5	0	3	4	5	2
Mutton.....	3	8	5	8	3	8	5	2
Lamb	5	0	7	0	5	4	6	8
Veal	4	0	5	0	4	0	5	0
Pork	4	0	4	10	3	6	4	6

For the time of year, Newgate and Lendenhall markets have been well supplied with meat, which has moved off slowly at the following average rates: Beef from 3s. 2d. to 4s. 6d., mutton 3s. 4d. to 4s. 6d., lamb 5s. to 6s., veal 3s. 8d. to 4s. 8d., and pork 3s. 4d. to 4s. 10d. per 5lbs. by the carcase.

WEST GLOUCESTERSHIRE.

A very lengthened period of dry weather during the spring months, after a winter singularly free from hard frosts, kept vegetation nearly in an average state of forwardness without producing rapid growth, and rain was very much required; that desirable visitation came somewhat late, nevertheless was highly acceptable. Light rain fell on the 4th of this month, which increased during the night, and continued nearly the whole of the following day, and there has been rain more or less from that time to the present, with occasional thunderstorms, most noticeable on the 10th and 12th—so heavy indeed on the former of these days that many fields in the vale of Berkeley were quickly covered with water. We have now enjoyed the benefits of a thorough good saturation, and some fine warm forcing weather will be exceedingly acceptable. The wheat generally looks well, we may say invariably so, with the exception of some on poor cold soils. The forward crops are coming into ear, to facilitate which warm sunshine will be a very great blessing. The spring crops are deriving vast benefit from the rain that has fallen: much of the barley on the Cotswold hills had scarcely come up, but is now growing fast. The change in the weather has checked the progress of haymaking, very little having been

cut, and scarcely any carried. A few forlorn fields of clover, cut before the rain commenced, are spoiled, and the heavy downpouring of rain on the 10th will much injure the grass in those fields which, from their flat formation, did not permit of its flowing freely into the brooks or watercourses. The early-sown mangolds are looking remarkably vigorous, and many must be too forward. Swedes are showing kindly, and as yet we have not heard much complaint of the fly; but those depredators are so capricious in their visits that it is impossible to say what swarms a single day propitious to their habits may produce. The present prospect of the potato crop is most cheering, but the time has scarcely arrived for the disease to make its appearance. There is quite an average quantity of fruit, apparently safe. The dry weather in May very materially checked the make of cheese. Tempted by an early nibble of grass, very many farmers turned out their cows before the usual time, who are already suffering for their precipitancy. The first bite being consumed, and in the absence of rain little or no progress taking place in the way of reproduction, the pastures soon became bare, and in many instances fields intended for the scythes have been yielded up to stock. The subject of agricultural statistics, it appears, is again disposed of till another session of Parliament, with the item of expenditure as the pretext: all means least likely to be successful have been suggested, and failing in these the next may possibly have a better fate.—June 19.

NORTH NORTHUMBERLAND.

Patience never with us was more practically demonstrated as a virtue, than in our departure for the last four or five weeks from usual routine of reporting progress of rural aspect, from this locality more particularly. "seed time and harvest" being the chief hope and dependence of the husbandman. As noted in our last report (nine weeks ago), for miles inward from the sea coast, were as dry as brick earth. Nor had we any change worthy of notice until the 9th, when the first thunder-storm for the season broke over our heads, with a pelting fall of hail and rain; and up to the hour we write most copious falls of the watery element have worked a mighty change in the appearance of all spring crops. That there may finally be either average bulk or yield from such cereals, the fondest anticipation does not predict, the naked soil being visible over large breadths of oats and barley, portions of spring-sown wheat also very deficient of plant. Such blanks are now daily filling up; weeds no doubt bearing a large proportion, such indigenous pests having had a long season for propagation. Winter and all autumn-sown wheats on deep well-cultivated lands have been less affected by our three months of unprecedented dry spring season than any other cereal, and generally kept a good colour, promising at this date a full bulk of straw. We saw the first ear out of sheath on the 15th, being fully two weeks in advance of last year, on the same farm. Much depends on the elementary visitation for the ensuing six weeks. At the utmost, we can only look forward to a slow lingering harvest. Oats and barley must harvest late. In the working department there has been little hindrance since the new year; only the rolling and clod-crushing have absorbed a very undue portion of team work; the weather ever favourable for cleaning out couch or other root weeds. Turnip sowing was early proceeded with; the braird of swedes invariably good. No complaint of insect ravages. The plant on many fields ready for thinning the first fine day; weather continues dark and foggy; land well soaked with wet; corn much in want of weeding, and a foot cannot be put on until dry. The surplus old stocks are being rapidly thrashed out, that could not be put down to litter at the proper season, the produce (wheat in particular) neither fine nor much for the sack. Very little, if anything, over half quantity from bulk in a good season, marketable at from 40s. to 45s. per qr. for the best, producing from 90s. to 112s. per acre, where grown on naked fallow—a small return to pay two years' rent and labour. Our May sales and fairs for cattle and sheep ruled high; prices of fat duly recorded in the journals of the day. Grazing animals of all descriptions also in good request. We have also the prospect of an unusual demand for wool, all tending to keep the breeder and flock-master far a-head of the unfortunate clodpole cultivating a bare clay soil. Old grass swards during the spring months kept very bare of feed. Within the last ten days the colour

of all grazings has completely changed. New grass hay will come off a very light crop; old meadows, where allowed a few weeks, may produce a great bulk. The great amount of drainage, so industriously followed over a large breadth of this county during the winter and spring months, caused a demand for surplus labour, and every willing man readily met with full employment. At this Midsummer season demand is less active; still we believe the willing workman can readily get a day's work at a fair day's wage. This evening the sun has once more shown the bright side.—June 18.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

APPLEBY FAIR.—Prices were high, and dealers from this district were realising a fair profit from their transactions. Mr. Coltart, Drummanister, sold 300 blackfaced wether hogs at 20s. each, and the same number of ewe hogs at 23s. 6d. a-head—in both cases the advance on last year's prices was 1s. a-head. There was an average supply of cattle. The demand was brisk for Polled cattle, the best heavy Galloways being in request, and heifers much sought after. Prices were high.

BAKEWELL FAIR was well attended by both sellers and buyers. There was a good supply of stock of almost every description. Milch cows have advanced in price since last accounts, and are in demand. In store stock (although some sales were effected) there was not much doing. The beef that was shown met a ready sale. A few ewes in wool were disposed of, and fat lambs were in great request for Buxton. Of pigs the supply of all kinds was good, and business was done freely.

BANBURY FAIR.—The supplies were about an average for the time of year, both in the beast and sheep markets. Trade was rather dull, except for the very best qualities of beef and mutton, which found a readier sale. Beef made from 8s. 4d. to 4s. 8d., and mutton from 4s. to 5s. the 8 lbs. upon the average.

BANNOCKBURN FAIR.—Cows were selling at from £9 to £12, and from £13 to £16 10s.; and grass beasts at from £6 6s. upwards. There was a large display of horses, consisting of roadsters, cart, and harness horses, with several small lots of ponies. The market was dull, and very few changed hands.

BRAMPTON HILL (WESTMORELAND) FAIR.—There was fully an average quantity of cattle, the demand was good, and no lack of dealers in attendance; but they hung back. Calving cows, and geld and strong bullocks were in good demand, but the quality was only limited. Highland cattle were readily disposed of, but Irish were a drug in the market. Most of the best animals never reached the fair, but were sold the previous evening at the show in the town. Anything really good and likely brought tolerable prices.

CAWDOR FAIR.—The market was an unusually good one for sellers, there being a great demand for grazing stock in consequence of the abundance of grass, and sellers not being particularly anxious to part with their cattle, held out for high prices. 16 three-year-old polled stots sold at £19; a lot of two-year-old polled stots sold at £18, a lot at £13 10s., and a lot at £14; one-year-old polled stots at £10; a pair of two-year-old queys sold for £17 5s.; 4 two-year-old crosses at £12 10s.; cross stirks at £7 10s.; three-year-old polled stots at £19; two-year-old crosses at £12 10s.: a lot of one-year-old polled stots at £9, and a lot of cross stirks at £8 5s.

DROITWICH FAIR was well attended. A large quantity of stock was exposed for sale, and a very good business was done. Beef 7d. to 7½d., Mutton 7d. per lb., Lambs 20s. to 30s. each.

GIFFORD TRYST.—This market, the most important for many years past, was principally composed of blackfaced three, four, and five year old wethers; the demand for this kind of stock was unusually great, more particularly for the better class; the Foleshill blackfaced wethers sold at 36s. per head—1s. less than last year. The length of the wool on these sheep was from 15 inches to 18 inches. Mr. Clapperton is the principal man who encourages blackfaced stock in the south of Scotland, and to-day he has got the largest price. Priestlaw also got 36s., Mayhiel 35s., Brycleugh 35s. Mr. Macmiven, salesman, Haddington, did a stroke of business at prices ranging from 35s. to 36s. The cow market

was somewhat thinly attended, and the better conditioned of those which have calved, or about to calve, would run from £15 to £18, the secondary class from £8 to £40, and the inferior kinds from £6 to £8; at the close of the market there were a few cows left unsold. The horse market had rather a short supply of all kinds, but draughts predominated. As high as £68 was given by a Glasgow brewing company; a few others were bought for the most part at prices ranging from £10 to £30; several horses were sold at a higher figure for agricultural purposes at from £20 to £30. Upon the whole, it was allowed that horses of all kinds would be down at least about 5 per cent. below the price of last year at this time.

GLOUCESTER MONTHLY MARKET.—There was more than an average supply, which met with a steady demand, nearly the whole being disposed of by auction. The number of sheep penned was quite equal to the demand, and prices ruled at former quotations. There was an average supply of lambs, which met with a ready sale. The following are the quotations: Beef from 6½d. to 7½d., mutton from 6½d. to 7½d., lamb from 8½d. to 9d. per lb., pigs from 9s. to 9s. 6d. per score.

GRANTHAM FAT STOCK MARKET.—There was an average show of sheep, and plenty of buyers, but business was very slow. There were 15 beasts offered at 8s. and 8s. 6d. per st., and 495 sheep at 6d. to 6½d. per lb.

LEDGERY FAIR.—There was but a short supply of stock of most kinds, more especially fat stock, but the prices were satisfactory to sellers. Beef sold at 7d. to 7½d., and we quote mutton at the same figure. The sheep, all shorn, were the most numerous description of stock. Lambs were dear, selling readily at 9d. Very few cows and calves. Some useful cart horses, but sales were not numerous, and the prices obtained were low. Pigs brought somewhat higher rates than of late.

LINCOLN FORTNIGHTLY MARKET.—There was a fair show of fat beasts, which met a tolerable sale, and recent rates were exceeded in some cases. The supply of sheep was good, and sales were effected at the prices of last market day. Beef 7s. to 8s. 6d. per 14lb., mutton 6d. to 7d. per lb.

LINLITHGOW FAIR.—The demand for good milch cows was fair, and prices were considered to be about an average with those obtained at Rutherglen. Good grass beasts were specially picked up at remunerative prices. Milch cows were selling at from £8 to £15.

MUIR OF ORD MARKET.—The following are a few of the sales: A lot of blackfaced yield ewes brought 16s. 9d., a mixed lot of two-year-old wethers 22s., a lot of half-bred ewes and lambs £2, another lot 30s., a lot of half-bred hogs 30s., a lot of Cheviot ewes and half-bred lambs 30s. 6d., a lot of half-bred hogs 28s., a lot of Cheviot ewes and lambs 30s., another lot of clipped Cheviot wether hogs 20s., a lot of Cheviot ewes and lambs 28s., a lot of blackfaced hogs 15s., a lot of blackfaced gimmers 16s., a lot of cross-wethers 22s., and a lot of blackfaced ewes and lambs 18s., two lots of blackfaced hogs 14s. 6d. and 10s., yield Cheviots 26s. The number of cattle was not equal to the corresponding market of last year, and on the whole the stock was very inferior. For the best lots of crosses there was a good demand, and these were picked up early. A great many Highland cattle were on the stances. A lot of cross stirks brought 11s., a lot of stots 12s. 5s., a lot of two year-olds 15s. 10s., a lot of two-year-old Highland cattle 6s. 10s., a lot of heifers 6s. 6d., a lot of two-year-olds 12s., another lot 5s. 15s., a lot of Highlanders 8s., a lot of fat stots 20s., a lot of heifers 16s. 10s., another lot at 14s. 5s.

NEWCASTLE (STAFFORDSHIRE) FAIR was tolerably well supplied with stock, but there was not much business done, purchasers being scarce. Good fresh barrens and coloury cows maintained former rates, but middling stock was lower and at that not easily sold. Fat cattle averaged from 7d. to 7½d. per lb. The pig market was the largest known for some time past, and many were sold, but at low rates.

OAKHAM FAIR.—There was a good supply of fat cattle, of average quality, and all were quickly disposed of at about 8s. 9d. per stone, but a few prime beasts made 9s. per stone. Cows and calves were well represented, and may be noted quite 10s. per head lower. Home-bred yearlings are not now selling for so much money; useful young beasts are fully 20s. per head lower since May fair, and Irish of the same age from 30s. to 30s. per head cheaper. The show of fat sheep

was very good, but the trade not quite so brisk; prices did not give way, which may be quoted at 6½d. to 6¾d. per lb.; a few lots remained unsold.

RETFORD FAIR.—There was decidedly the largest show of stock exhibited than we have ever seen before since its first establishment in 1839. Store hogs fetched from 34s. to 37s. a-head, at which all were readily sold. Very few fat sheep were exhibited, and these fetched from 6d. to 7d. per lb., of course out of their wool. Now with regard to beef; the quantity of fat stock was not large, and the prices obtained were from 7s. 6d. to 8s. per stone. Steers up to two years old, in moderate condition, readily fetched fully £10 10s. per head, and more of them would have been sold had they been offered. Bullocks fetched from £13 to £15 a-piece. In-calfing beasts were not quite so numerous as usual, but those likely for business were readily sold at from £15 to £18 a-head. There was a large quantity of young yearling stores exhibited, for which very high prices were demanded; those realised were from £5 to £8 10s. per head. Most of the stock exhibited were disposed of, and upon the whole we may say the result was a good business-like transaction.

ROTHERFIELD FAIR.—The Welsh stock far outnumbered those shown at any fair here at this time of year for a vast number of years, but many remained unsold. The show of home beasts was not large, and sold rather sluggishly. A small number of horses, and very few changed hands.

TARBOLTON FAIR.—There was a large number of cattle. The quality of many of the animals was first-rate, and good prices were obtained. It was altogether a good selling market, and at the close very few cattle remained unsold. Cows sold from £10 to £12, several fine animals bringing £15. Calving queys brought from £7 to £11. Yeld queys realised from £4 to £7. Sticks were sold from £8 10s. to £4 10s.

TEWKESBURY FAIR was largely attended by butchers and dealers, and more stock was brought than is usual at a June fair. The greater part of the stock was entrusted to the auctioneers for sale. Fat sheep made from 38s. to 59s., ewes and lambs 49s. to 57s., fat lambs 22s. to 30s. 6d., fat cows from £18 to £23 15s., barrens from £12 to £17 10s. There were a few good horses, but the trade was generally dull.

TAUNTON FAIR was very thinly supplied. The fat beasts fetched from 11s. to 11s. 6d. per score, mutton—ewe 5½d. to 6d., wethers 6½d. to 7d. per lb. The horse fair was fully attended, and good animals fetched high prices.

THORNE FAIR.—Of horses there was an unusual number, and there being few buyers, few sales were effected. There was a good show of stock, and all descriptions suitable for grazing were in demand, and realised full rates. In point of extent the fair was not so large as that of last year, but this was more than compensated for by the better quality offered. Bullocks fetched £8 10s. to £13 10s. per head, and heifers ran up to £18 in some instances, but that was the extreme rate paid. Business was brisk, and all was well sold up. Lean and Irish stock made fair prices, and trade may be regarded as brisk. As showing an improvement in the quotations of this year as compared with last, we may state that in the opinion of competent persons, stock was from 20s. to 30s. per head dearer than last season. The show of fat cattle was also large, but prices not quite so firm.

IRISH FAIRS.—**BALLA:** The demand for cattle being brisk, prices were obtained up to the fullest anticipation of farmers. Bullocks and heifers in condition sold most readily, and the unsold were owing to the want of condition or unreasonable demands. The number of small farmers' cattle offered for sale was numerous, but very inferior in condition; nevertheless buyers were had for this class of wretched stock at prices varying from £3 10s. to £5. Heifers were in improved demand, but bullocks, as heretofore, received the earliest attention. The demand for odd cattle was in excess of late fairs, but the owners seemed to appreciate the demand, so much so that single cattle rated at fully 20 per cent. over the prices of lots of the same classes of stock. The sheep fair was very well supplied, and although sales were effected in hoggets and lambs there was an evident dullness in the demand, especially fat sheep (shorn), notwithstanding the present high price of wool. The supply of cattle was principally composed of small farmers' stock of good quality, which met ready demand and fair prices. **OLDSTON:** Young cattle for grazing purposes were in great demand, and sold at remunerative prices. Mutton sold at 6d. to 7½d. per lb., and lambs at 20s. to 28s. a-piece. Horses of

an inferior description changed hands at prices ranging from £15 to £40 each on an average, whilst those of a superior class, which were sold at Antrim prior to the fair, brought £70 to £90 each. **KELLS:** Some splendid grass-fed cattle were disposed of, in one or two instances fetching 65s. per cwt. in sink, second quality from 52s. 6d. to 55s., and coarse lots in proportion. So much could not be said for store cattle, yet in the meantime those of a good kind that had got the grass commanded remunerative prices. A few lots of the choice two-year-old heifers in the fair went to £10, and £8 was the general run. Milkers and springing cattle were in fair supply, but the demand was not up to expectations. Springers rated from £10 to £15 10s., and £16, milk cows from £8 to £14 according to merit. Mutton maintained late rates—wether selling from 7d. to 7½d. for prime lots, and ewe from 6d. to 6½d. per lb. Lambs were plentiful, and commanded pretty brisk sales, principally for shipment. Prices ranged from £1 2s. to £1 12s. each, and all were bought up an early hour. There was an immense show of store and creel pigs, but comparatively few in the heavy line. Bacon and pork rated from 46s. to 48s. per cwt. Store pigs sold from 25s. to 40s. each. Suckers and weanlings from 10s. to 15s.

MR. NOAKES'S SHORTHORN SALE.—The entire shorthorn herd of this well-known breeder, who has held his own so well in the showyards of Kent and Surrey, was sold at Brockley, near Lewisham, by Mr. Stratford on Tuesday last. The assembly of breeders of mark from the South Country was pretty large; and fully 200 visitors sat down to a splendid luncheon. The stock, with the exception of a few calves, looked very blooming, and the average, £36 8s. 2d. for 43 head, considering that the second Babraham sale is so near, was a very fair one. The 34 cows and heifers averaged £39 2s. 6d., and the 9 bulls £38 2s. 8d., making a sum total of £1,565 11s. Lord Walsingham bought three lots, Fuchsia (34gs.), Helena (50gs.), and Spangle (30gs.). Eight lots went to the nod of Mr. Robert Sharpe, of Courtland, near East Grinstead, two of them daughters of Fuchsia, to wit Lovely (40gs.) and Elegant (50 gs.); the latter a truly elegant yearling heifer by Cherry Duke 3rd (15763), and considered by many the cream of the sale. Among the other purchasers were Mr. Gobbole, of Rye (3 lots), Mr. Kitchen, of Waterham (6 lots), including a very clever calf, Pride of Brockley, by Cherry Duke 3rd, from Helena, and a good yearling heifer Wild Rose, by Orthodox 28th, from Wild Rose. Mr. Gebhardt took two lots for Germany, and Mr. E. Hales two lots, one of them Cherry Duke 3rd (40gs.). The highest price lot was the five year old cow Waterloo 23rd, by Prince Imperial, from Waterloo 17th, which was sold to Mr. McIntosh, of Havering Park, Romford. The other purchasers were Messrs. J. Gosling, Davis, T. Crisp, Judkins, Hornby, F. Leney, F. Turner, R. Hemming, Martin, Tapley, Holbeck, Mertons, W. Burton, Pack, Black, Kingnorth, Wheatley, Maxwell, and Stoneham. The Duke of Sussex, purchased by the last named gentleman, was a good calf of three months old, by the Fourth Duke of Thorndale, from Nightshade, by Earl of Oxford (15966). Some very useful Don John colts, and the pure Kentish sheep, fine longwools of rather a Leicester character, but smaller, did not change hands.

MR. HOUSMAN'S SHORTHORNS.—On Tuesday last, six shorthorn bulls, bred by and the property of R. F. Housman, Esq., and three cows and two calves, the property of John Hull, Esq., Warton Bank, near Kirkham, were offered for sale in the field adjoining the residence of Mr. Housman, at Lune Bank, near this town. The attendance was not so large as might have been expected from the reputation of Mr. Housman as a breeder, but it included several representatives of well-known herds. The first bull placed in the ring was Heir Apparent, red and white, calved 25th March, 1862. It was by Heirloom, which was got by Duke of Buckingham, and Heir Apparent's dam Saltana owned the same sire. The hammer fell to 18 gs., the purchaser being Mr. T. B. Kaye, of Wray, but the bull, we believe, will be sent into Ireland. 2. Imperial Buckingham, red and white, calved 18th May, 1862. This was an animal of almost pure Booth blood. It was got by Imperial Windsor (who is now serving at a rent of £120 a year), its dam being Duchess of Buckingham, by Duke of Buckingham. After some spirited bidding this promising young bull was "knocked down" at 41 gs. to Mr. Henry

Morphet, of Camp House, near Hornby. 3. Imperialist, red calved 2nd June 1862, got by Imperial Windsor, its dam being Starlight by Duke of Buckingham. Sold to Mr. Ralph Proctor, of Preston, for 31 gs. 4. Royalist, white, calved 16th September, 1862. This young bull, besides being half Booth, inherits some of the finest shorthorn blood, its sire being Royal Windsor, and by its dam Lady Beaumont, it gets the famous Cherry blood through three of her crosses. It was bought by Mr. Wm. Seed, of Yealand Hall, for 21 gs., who must be well satisfied with his bargain. 5. Baron Blencow, white, calved 10th October, 1862, got by Royal Windsor, its dam being Strawberry Duchess, by Duke of Buckingham. This was a three-quarters Booth bull. It was purchased by Mr. Siye, of Beaumont Grange, for 20 gs. 6. Cumberland, roan, calved 9th December, 1862, got by Heirloom, dam White Strawberry, by Duke of Cambridge. This young animal was of choice breed, and was obtained by Mr. William Pennington, of Bulk, for 10½ gs. The cows were next offered for sale. The first was Dacier, a roan, bred by Mr. H. Tempest, of Newland Park, and about five years old. It was by Lowther, out of Diana, by Omer Pasha. It fetched 26 gs., and was obtained by Mr. John Cock, of Coat Green, near Burton-in-Kendal. 2. Amelia 7th, roan, calved 29th March, 1861, got by Agamemnon, dam Amelia 2nd by Frederick. It was sold for 29 gs. to George Drewry, Esq., of Holker. 3. Louisa Pyne, a beautiful red heifer, was bought in after the bidding had reached 19 gs. A roan heifer calf calved on the 6th of April last, out of Dacier, by Son of Prince of Prussia, and a white bull calf, calved April 22nd, out of Amelia 7th, by Son of Prince of Prussia, were both purchased by Mr. Willacy, of Penwortham, for 6 and 3 guineas respectively. Mr. Vince acted as auctioneer.—*Local Journal*.

THE ANNUAL SALE OF FAT STOCK, AT RANGE-MOOR, BURTON-UPON-TRENT.—The annual sale of fat cattle and sheep, the property of M. T. Bass, Esq., M.P., was held at his Rangemoor Farm, Needwood, on Monday last, Mr. Leedam being the auctioneer. The stock included 26 short-horned heifers, 29 Scotch (Galloway) heifers, and 140 fat wethers. The highest price given for a short-horned heifer being £33 10s., and the average, £27 0s. 11d.; and the highest price given for a Scotch heifer was £35, the average, £24 17s. 11d. The 28 pens of five fat wethers produced an average of 57s. 7½d. each, the highest price of a pen being £18 10s., or 74s. each.

CHIPPENHAM AGRICULTURAL ASSOCIATION.

TRIAL OF MOWERS.

The trial of mowing machines for premiums offered through the Society by Mr. J. Lysley, M.P., took place on Friday near the town. The day was most unpropitious, still, notwithstanding there was a steady down-pour of rain the whole time, there was a large number of agriculturists and a larger number of labourers present to witness the proceedings. Some of the latter were rather disappointed in not seeing any of the machines "come to grief"; but the whole of the work, with the exception of No. 1, was done in a masterly manner. Five out of six did the allotted work without a stoppage by breakage or for alteration.

The committee had some difficulty in obtaining a field for the trial so early in the season with anything like a crop upon it. The one offered by Mr. Noon was scarcely large enough for the number of machines; three-quarters of an acre was all that could be given to each competitor. The following is the list of entries—

1. Ed. Penett, Peurham (Woods).
2. W. Huff, Chippenham, (Woods).
3. W. J. Boon, Hazelbury (Burgess and Key).
4. Pidgeon, Banbury (Samuelson).
5. J. Willes, Cancourt (Woods).
6. N. Rix, London (Burgess and Key).

The work was completed in about three-quarters of an hour. The Judges, Mr. Thompson, of Badminton, and Mr. J. V. Toone, of Warminster, awarded the first prize of £5 to

No. 6, Burgess and Key, the machine belonging to the firm for which Mr. Rix is the travelling agent; the second prize of £3 was given to No. 2, belonging to Mr. W. Huff, who is also the agent of Wood's machine. There was no doubt about the first prize, but it would have been more satisfactory to some parties if Mr. Rix's mower had been for sale, and not, as Mr. Rix publicly admitted, kept purposely for public trials. The contest for second prize lay between No. 2 (Wood's) and No. 4 (Samuelson's); the latter was not set quite low enough. Although the work was very evenly done, there was too much of the bottom grass left on; consequently the judges gave it in favour of Wood's machine. Both the winners had an advantage over the rest, as they were managed by very experienced men, who are constantly in the habit of working the machines at public trials; otherwise, it was a very fair competition, and proved the machines could do their work in wet weather as well as dry.

NORTH HANTS AGRICULTURAL SOCIETY.

On Thursday, June 4, the annual meeting was held at Basingstoke. The usual show took place at Fairfields, and the weather proving exceedingly fine, there was a large influx of visitors, the receipts from this source yielding a very satisfactory contribution to the Funds of the Society.

PRIZES.

Ewe Tegs—1st prize, £3, Mr. James Crimble, Southington Overton; 2nd, Mr. W. Harris, Park Privett Farm, Sherborne St. John.

Ewe Tegs—1st prize, £3, the Earl of Uxbridge, Grange Farm, Herriard, Basingstoke; 2nd, Mr. W. Spencer, Barton Stacey, Stockbridge.

Ewes of any age—1st prize, £2, the Earl of Uxbridge; 2nd, £1 10s., Mr. John Wigg, Byfleet Manor Farm, Basing. Mr. John Butler, Sherfield, and Mr. W. Harris commended.

Shearing Rams—1st prize, £3, Mr. W. Spencer; 2nd, £1 10s., Mr. E. Olding, Ratfin Farm, Amesbury. Mr. J. R. Neate, Northington, and Mr. W. Pain, Woodmancot, h. com.

Rams of any age—1st prize, £2, Messrs. J. and M. Arnold, Westmeon. Mr. J. Barton, Hackwood Farm, and Messrs. J. and M. Arnold commended.

Rams of any age—1st prize, £3, Mrs. Clift, Sherborne St. John; 2nd, £2, Mr. R. Awbrey, St. Lawrence Wootton.

Ram Lambs of any breed—1st prize, £3, Mr. E. Olding; 2nd, £1 10s., Mr. W. F. Bennett, Chilmark, Salisbury.

Stallions—A prize of £4, Mr. W. Sherley, Egham.

Two-year-old Stallions—A prize of £4, Rev. S. Terry, Dummer.

Mare and Foal—A prize of £3, W. L. W. Chute, Esq., The Vyne. Mr. W. Follett, Pamper, highly commended.

Three-year-old Filly—A prize of £2, W. L. Chute, Esq., The Vyne. Mr. John Barton highly commended.

Two-year-old Filly—A prize of £2, Mr. W. Parsons, Monk Sherborne. Mr. J. Messenger, Bonhams, Alton, commended.

Bulls—A prize of £3, Mr. W. W. Champion, Calcot, Reading; 2nd, £1 10s., ditto. David Smith, Esq., Baughurst, highly commended.

Cows in Milk—A prize of £3, Mr. T. W. Goddard, Murrell Green.

Heifer under Three years old—A prize of £3, Mr. W. W. Champion, Calcot, Reading. Mr. G. Twitchen, Worting Wood Farm, commended.

Heifer under Two years old—A prize of £2, Mr. J. Margeton, Shalden, Alton.

Berkshire Boar—A prize of £3, Mr. Wm. Parsons, Monk Sherborne.

Boar of any other Breed—A prize of £2, Mr. W. Box, Farleigh Wallop.

Berkshire Breeding Sows—A prize of £2, Rev. S. Terry, Dummer. Ditto commended.

Sow of any other Breed—A prize of £2, Mr. W. A. Box, Farleigh Wallop.

Extra Stock.—Cows—Mr. W. Box, Farleigh Wallop, commended. Pigs—Mr. W. Box, Melville Portal, Esq., Mr. A. Twitchen, highly commended; Mr. E. S. Adams commended.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

Though there was still a deficiency of moisture at the commencement of June, the month has had frequent showers, and some whole nights of rain, especially towards the latter end, so that warmth is now only wanted for the advancement of the crops. The temperature on the whole has been very fluctuating, and some fears have been entertained for the wheat in bloom; but the timely and sufficient rainfall has been of immense benefit to the spring corn and late grass, of which there must now shortly be plenty. It is said, however, that the wheat does not equal its first promise: the ear is coming out without a vigorous flag to sustain and perfect the fructification; but with genial weather a fair average may be gathered. The drought feared in many parts of the Continent and complained of in others has now happily ceased; but its effects are said to be visible in the growing crops of Hungary, which are expected to be very short, while storms and floods have beaten down the wheat extensively in Piedmont and Lombardy, sending up prices in the neighbouring provinces. What gatherings there can be amidst the desolations of war in Poland, where scythes are turned into implements of war, we can scarcely divine; but if the crops are suffered to mature, will labourers be forthcoming to gather them? And as to America, receipts are so falling off in the far West that to expect a renewal of the late extraordinary influx or any progressive increase of tillage without peace seems equally unreasonable. Indeed, prices abroad, excepting the latter country, have been generally advancing, so as to bring on a demand for the neighbouring countries, France, Belgium, and Holland, where stocks have been materially reduced, and stimulated the enquiry, though in all these places wheat is said to promise well. Our own prices throughout the month have remained much the same, closing with an upward tendency, in consequence of this foreign demand. Now, as dull markets here for a long time past have tested the disposition of the places of export, we think we may safely conclude there is no prospect of a serious fall before harvest, with a much greater probability of advance, especially in the event of peace in North America, as there is great pressure experienced by the Southern States in consequence of the long prosecution of the war. The present rate of foreign imports, indeed, shows a considerable falling off, and very many of the floating cargoes from the Mediterranean have been sent on to the Continent as presenting a better market than England. One circumstance which all this season has hung heavily upon the English wheat trade is its inferiority in flour-producing properties, only ascertained by manufacture; and this inferiority remains, notwithstanding the great improvement of the condition of samples. Instead, therefore, of taking the lead, as in many former years, the small English supply has been regularly passed over by first-rate millers as below

their requirements; and those who by its comparative cheapness have been tempted to purchase, and make flour for the London market, have found out its small value and unsaleableness. To this also is to be attributed its present comparative abundance, after a very deficient crop, the foreign having been preferred; but this preference is now reducing stocks and hardening values. The following rates have been current recently at the places named: At Paris the best white native wheat was worth 56s. per qr.; at Antwerp Baltic and American red have brought 54s.; at Amsterdam high-mixed Polish was worth 57s. 6d.; Marks and Wahren red at Hambro', 53s.; Danish red, 46s. High-mixed at Danzig sold at 53s., with more enquiry for France. Native wheat at Cologne was valued at 52s. 6d. per qr. At Straubing, in Bavaria, the best samples sold readily at 48s. 6d. Fine qualities were yet comparatively scarce at Odessa; Sandomirka to 41s.; Ghirka, 40s.; Buhi, at Alexandria, 37s.; Banat, at Trieste, 42s.; native, at Venice, 46s.; fine Blanquillo, at Valladolid, 51s. per qr. Red winter, at Montreal, 34s. 6d. per 480 lbs.; the same at New York, 34s. 6d. per qr. Chicago spring to 33s. 6d.; amber to 34s. per 480 lbs.

The first Monday in Mark-lane opened on a small supply of wheat, both English and foreign. Very few additions during the morning were made from Kent and Essex, and the samples being mostly in fair condition they went off readily, at the previous currency. The business in foreign was only on a small scale, but holders obtained fully as much money for choice quality, as well as red American winter. Cargoes off the coast also went off well, at full prices. Supplies in country markets this week varied, some being deficient and others plentiful. More firmness was evinced at several places, as Hull, St. Ives, Rotherham, Rugby, Rochester, and Melton Mowbray, and the general tendency was this way, though some markets were still dull and drooping. Liverpool was among the latter all through the week, a decline of 1d. to 2d. per cental being noted on the last market. Scotland varied, Edinburgh being firm, and Glasgow the reverse. There was no quotable change in Ireland.

The second Monday still had a small English supply, but that from the Continent was much increased. Few samples were sent up in the course of the morning from the near counties; but this was a dull day, and they moved off with difficulty, at former rates. Half the foreign supply being from Danzig, this quality was forced off in some instances by steamer, and prices were consequently lowered 1s. to 2s. per qr.; and Baltic sorts were generally in buyers' favour, the others being only dull. With heavy arrivals off the coast, prices gave way 1s. per qr. Beneficial rains having abundantly fallen, these with the dull accounts from London, produced similar reports from the country markets; but the cases of positive reduction were few, and they were mostly limited to

secondary qualities, to the extent of 1s. per qr.; but Liverpool was down on Tuesday 2d. per cental, with the same tendency on Friday. Edinburgh and Glasgow reported a decline on Wheat of 1s. per qr.; but at Dublin, though there was dulness, there was no decline.

The third Monday was moderately supplied from abroad, with about the usual small quantity of English. The few samples showing this morning from Kent were taken off very readily, at fully as much money. Those on the Essex stands were not so easily placed, but there was no giving way, and finally all were nearly cleared at unchanged quotations. There being some enquiry for France for low foreign and red American, these sorts were generally held for 1s. per qr. more money; but it was paid in but few instances, the French demand being less lively than on the previous Friday, though agents were still in the market. The consumptive trade in foreign was but slow, but the demand for the Continent enabled holders of floating cargoes to make free sales at full prices. The country markets this week were generally firmer, Bury St. Edmunds, Hull, Spalding, and Newmarket, being 1s. per qr. dearer, as well as some other places; but some were again dull, and among them were Selby, Rotherham, Stockton, and Bourn. Liverpool recovered on Tuesday from the previous market's decline of 1d. to 2d. per cental, but there was no subsequent change. Edinburgh and Glasgow were dull, but prices were much the same. In Ireland, with good reports generally of the crops, markets were heavy.

The fourth Monday commenced on the back of rather better supplies of home-growth, though the foreign arrivals were only moderate. The samples sent up this morning from Kent and Essex were but few. Some of the Kentish red was taken for France at 1s. per qr. more money; but English millers would give no advance for either white or red, excepting very choice lots. In the foreign trade also there was an enquiry for winter red American; but holders requiring more money from the shortness of stocks and the prospects of diminished supplies, transactions were scanty. Floating cargoes were, however, still taken for the Continent at full prices, but not with the eagerness of the previous week.

The imports into London during the four weeks were 15,440 qrs. English, 54,090 qrs. foreign, against 8,395 qrs. English, 94,226 qrs. foreign for the same time in 1862. The imports for the kingdom for four weeks up to 13th June were in wheat 340,953 qrs., in flour 290,073 cwt. The averages commenced at 46s. 8d., and closed at 46s. 11d. per qr. The four weeks' exports from London were 3,104 qrs. wheat, 344 cwt. flour.

The flour trade for the same period has been steadily dull, excepting the last week, in consequence of a French demand taking off some of the recent arrivals from America in bond, which enabled holders to get rather more than if duty had been paid. Norfolks and all country sorts have remained a heavy sale, without quotable change of value, and the best town-made has been kept up to 47s. per sack, much fine foreign wheat being required in the manufacture. The London imports for four weeks were in country sorts 54,004 sacks, in foreign 2,597 sacks 60,015 bbls., against 41,027 sacks country, 557 sacks 32,853

bbls. foreign in 1862. But a small proportion, however, of the American here is fine, and hence the difficulty of sales.

English barley has maintained its price through the month, from the exhaustion of stocks and great falling off in foreign supplies, though the fine rains have very much improved prospects of a crop. Stout foreign has been in demand for porter malt at 30s. to 31s. per qr., and grinding has been steadily in demand at rather improved rates, say 27s. for Danube; and as much does not seem coming forward as yet from the places of export, say the Danube and Black Sea, so prices seem likely to be maintained. The imports into London for the four weeks were in English sorts only 847 qrs., with 23,518 qrs. foreign, against 930 qrs. English and 43,850 qrs. foreign for the same period in 1862.

The malt trade since the beneficial fall of rain has been very dull, and prices of even the best qualities sustained with difficulty, though previously they had been hardening.

The prices of oats for the last four weeks in London have rather given way, notwithstanding the reduction submitted to at the close of last month. Heavy arrivals have been pretty constant, the last week's reaching to about 70,000 qrs. Among these were over 10,000 qrs. from Petersburg and Riga. The decline for the month, however, has not exceeded 1s. per qr., half taking place at the last market. Rates are now low: occasionally large shipments are made per steamer from Sweden, which require immediate sale, much to the detriment of cargoes with many lay days to run out. 40lbs. Swedish have been selling at 20s. 6d., and these prices have materially affected the value of hay, being relatively cheaper; but we can scarcely look for any further material decline, as our own stocks seem nearly exhausted, and almost nothing comes from Scotland and Ireland. The imports into London for the four weeks were in English qualities 3,139 qrs., Scotch 588 qrs., Irish 671 qrs., foreign 178,659 qrs., against 9,612 qrs. English, 9,048 qrs. Scotch, 4,365 qrs. Irish, 166,869 qrs. foreign for the same time in 1862.

With moderate supplies of English beans, and fair arrivals of foreign, prices have been very firm. The general coldness of the season has had something to do with this improvement, and the late drought commenced it. Egyptian beans of good new quality have been worth fully 33s. At Alexandria they have been worth 27s., leaving but little margin for importers. In Barbary and Algeria a temporary scarcity made prices high; but for delivery of the new crop rates have been coming down. The imports into London for four weeks were in English sorts 1,404 qrs., in foreign 11,102 qrs., against 1,698 qrs. English, 10,640 qrs. foreign in 1862.

The supply of English peas has been very small, and not heavy from abroad; and as stocks in granary have been gradually lessening by a continuous feeding demand, rates have rather hardened during the month; but the season for boilers being over, their value is much the same. The imports into London for four weeks were 298 qrs. English, 4,097 qrs. foreign, against 365 qrs. English, 740 qrs. foreign in 1862. There is, therefore, a large in-

crease of foreign, but the reduction of stocks made them welcome without reducing prices.

Though supplies of linseed during the month have been fair, the tendency of prices has been constantly upwards; low stocks, an increased consumption, and generally bad crops abroad, all contributing to keep rates at a high range. The shortness of grass for a time also gave more value to cake; but since the rain and more abundant feed these have been rather easier.

The seed trade during the month has been very calm. The first crop of clover, like that of grass, must be very poor; but there is plenty of time for a good crop of seed on the second cut; and there has been less demand for American red lately, though prices remain low. In white cloverseed and trefoil nothing has been doing. Fine canaryseed has been rather firmer, but inferior has continued very dull, and all seeds have nominally preserved their value.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.	
WHEAT, Essex and Kent, white.....new 40 to 50 old 49 to 53		
" " red.....	40	49
Norfolk, Lincoln, & Yorksh., red ..	40	49
BARLEY, new, malting.....39 to 38.....Chevalier..	38	40
Grinding.....36	37	Distilling..
MALT, Essex, Norfolk, and Suffolk	60	68
Kingston, Ware, and town-made.....	60	68
Brown	50	57
EYE, new	34	35
OATS, English, feed 18 to 23 ...Potato.....	32	36
Scotch, feed	30	33
Irish, feed, white 16	19	fine 19
Ditto, black.....	16	19
BEANS, Mangani ..new 30 to 33.....Ticks.....	30	33
Harrow.....	32	37
Pigeon	38	44
PEAS, white, boilers ..	37	39
Maple 38 to 40 Grey 35	36	36
FLOUR, per sack of 280 lbs., Town, Households.....	40	47
Country.....	30 to 33	Households.....
Norfolk and Suffolk, ex-ship.....	39	31

FOREIGN GRAIN.

	Shillings per Quarter.	
WHEAT, Danube, mixed	51 to 54	extra 55 to 61
Konigsberg	50	52
Rostock.....	50	53
Silesian, red.....	47	51
Pommern, Mecklenburg, and Uckermark, red.....	47	51
Danish and Holstein	46	50
Russian, hard 40 to 43... St. Petersburg and Riga	41	47
French, none.....	50	51
American, red winter 47	49	spring 43
white 50	53	
BARLEY, grinding...33 to 37...distilling and malting	30	34
OATS, Dutch, brew, and Poland...18 to 23....feed..	15	21
Danish and Swedish, feed...17 to 23....Stralsund..	19	22
Russian, Riga 30 to 33, Archangel 30 to 33, P'eburg	30	34
BEANS, Friesland and Holstein	34	37
Konigsberg.....	31 to 34	Egyptian....
FEAS, feeding and maple....35	38	fine boilers....
INDIAN CORN, white	30	33
yellow	29	31
FLOUR, per sack...French 38	42	Spanish, per sack
American, per brl...31 to 34....extra and dble..	34	37
TARES, Spring small 31 to 38 large 43 to 44...Lentils	39	30

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS :	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
May 9, 1863....	46 2	34 4	23 1	30 11	37 6	34 0
May 16, 1863....	46 9	34 5	21 11	33 7	38 3	35 8
May 23, 1863....	46 8	33 9	22 7	34 6	38 6	36 8
May 30, 1863....	46 5	33 8	23 8	34 0	38 11	35 9
June 6, 1863....	46 10	31 11	23 10	32 5	39 10	36 8
June 13, 1863....	46 11	32 4	22 10	34 10	39 8	36 11
Aggregate Average:	46 8	33 5	23 6	34 5	38 9	35 11
Same time last year:	56 2	26 7	23 5	38 10	40 4	39 8

COMPARATIVE AVERAGES—1863-62.

From last Friday's Gas. s. d.	From Gazette of 1862. s. d.
Wheat..... 75642 qrs. 46 11	Wheat..... 54004 qrs. 43 9
Barley..... 1766 .. 33 4	Barley..... 1388 .. 33 3
Oats..... 6166 .. 23 10	Oats..... 5463 .. 24 4
Eye..... 106 .. 34 10	Eye..... 18 .. 33 9
Beans..... 3029 .. 39 6	Beans..... 2464 .. 40 1
Peas..... 160 .. 26 11	Peas..... 117 .. 27 9

PRICES OF SEEDS.

BRITISH SEEDS.

MUSTARD, per bush., white	7s. to 9s.
CORIANDER, per cwt.....	14s. 16s.
CANARY, per qr.....	46s. 52s.
TARES, winter, new, per bushel.....	—s. —s.
TREFOIL.....	—s. —s.
LINSEED, per qr., sowing —s. to 74s. crushing 52s.	68s.
LINSEED CAKE, per ton.....	£9 10s. to £10 10s.
RAPSEED, per qr	80s. to 84s.
RAPSEED CAKE, per ton.....	£5 10s. to £6 0s.

FOREIGN SEEDS.

CLOVERSEED, red 50s. to 65s., white	45s. to 70s.
HEMPSEED, small —s. per qr., Dutch.....	—s. 48s.
TREFOIL	30s. 24s.
CARRAWAY	—s. —s.
CORIANDER, per cwt.....	16s. 18s.
LINSEED, per qr., Baltic 58s. to 60s....Bombay 68s.	—s.
LINSEED CAKE, per ton.....	£9 10s. to £11 0s.
RAPSEED, Dutch	—s. to —s.
RAPSEED CAKE, per ton.....	£6 0s. to £6 0s.

HOP MARKET.

LONDON, MONDAY June 22.—Our Market continues steady, with a limited demand for the last growth. The reports from the Weald of Kent, the Western part of Sussex, and the Hampshire districts speak of an increase of vermin, and the blight assuming a serious aspect. From the other districts the reports are more favourable.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

BOROUGH, MONDAY, June 22.—Old potatoes are very dull, and Yorkshire Flukes are now quoted at 100s. to 120s. per ton. Considerable quantities of new foreign potatoes are on offer, and the supply of home-grown produce is seasonably good. The quotation varies from 8s. to 12s. per cwt. Last week's imports were 11,215 baskets from Rotterdam, 1,655 from Dunkirk, 208 from Cherbourg, 121 from Boulogne, 6 bushels from Bordeaux, and 942 boxes from Liabon.

COUNTRY POTATO MARKETS. — DONCASTER (Saturday last): A very small supply of old Potatoes, principally flukes, which sold at the following prices: Wholesale, 14s. per load, retail 1s. to 1s. 4d. per peck. New Potatoes 8s. per peck; retail, 2d. to 2½d. per lb. MANCHESTER (Saturday last): Potatoes 5s. to 10s. per 252 lbs., new ditto 20s. to 33s.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, June 22.—With fine weather and an abundant supply of Butter, our trade is very slow, and prices are hardly supported.

Dorset, fine 96s. to 98s. per cwt. |

 " Middling nominal, |

 Devon..... 92s. to 94s. |

 Fresh 10s. to 12s. per doz. lbs. |

CARMARTHEN BUTTER MARKET, (Saturday last).—The quantity of butter offered this day was above the average, and inferior qualities were easier to buy; but all of prime quality freely realised from 80s. to 84s. After a downfall of heavy rains for the last fortnight, the weather appears to have settled to-day, with the wind well up to the northward; fine warm sunshine, and every prospect of continuance, which will cause the value of butter to continue steady, if not to range lower still.

CORK BUTTER EXCHANGE, (Saturday last).—The supplies this week averaged 2,000 firkins daily. Owing to the heavy supplies arriving in London and Liverpool, the trade here was dull this week. The price opened at 87s., 88s., and 71s. for firsts, seconds, and thirds, and closed to-day at the same figures; but fourths rose from 56s. to 61s., and fifths from 48s. to 47s. The supply of light salt averaged 200 firkins daily. Firsts remained at 89s., seconds fell from 85s. to 84s., and thirds from 80s. to 78s. on the week.

WOOL MARKETS. ENGLISH WOOL MARKET.

CITY, MONDAY, June 22.—For home use the demand for most kinds of home-grown Wool is somewhat firm, and prices generally are well supported. Several parcels have changed hands for shipment to France and Belgium, but the export trade is by no means active. The supply of Wool on offer is reasonably extensive.

CURRENT PRICES OF WOOL. ENGLISH (per lb.)

s. d.	s. d.	s. d.	s. d.
Middle hoggets 1 10½ to 1 11½	Combing skins 1 5½ to 1 7		
Ditto wethers.. 1 8½ to 1 9½	Carding ditto.. 1 3 to 1 5		
Hf.-bred hoggs. 1 9 to 1 10½	Head ditto.... 0 10 to 1 1		
Down tegs.... 1 8 to 1 9	Nolls 1 1 to 1 3		
Down ewes.... 1 7 to 1 8½	Brokes 1 1 to 1 3		

s. d.	s. d.	s. d.	s. d.
Laid Highland 17 0 to 18 0	Laid Cheviot.. 20 0 to 30 0		
White ditto .. 19 0 to 21 0	Laid Cross.... 18 0 to 21 0		
	White Cheviot, 34s. to 42s.		

BRADFORD WOOL MARKET, (Thursday last.)—A fair quantity of the new clip is now finding its way to our market, but owing to the enormous prices paid for it in the country it does not find its way into the consumers' hands so rapidly as was expected. Staplers are obliged to stand out to-day for higher prices by ¼d. to ½d. per lb., this checks business, except for immediate wants; and it would appear that the speculative staplers and one or two of the largest spinners will have to run the risk of stocks bought at present rates, as the bulk of the consumers evidently intend to buy from hand to mouth as long as prices range as they do at present.

DONCASTER WOOL MARKET, (Saturday last.)—At this the third market of the present season more wool was shown than we ever had at one day before in any former year. Some irregularity in the delivery of the wool from the station caused delay in weighing, and the market was, in consequence of that and the very large quantity, protracted to a later hour than usual. Buyers had a slight advantage to-day, very trifling. Generally prices were similar to last week. All hoggs fine 28s., one-third to one-half 27s., all ewe and wether 24s., large 14s. per 14½lbs.

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS, (Friday last.)—The price of English wool is being fully maintained, and there does not seem a prospect of material alteration for some time. Colonial wool goes slowly into consumption without any change in price. There seems no expectation of higher prices at present.

YORK WOOL MARKET, June 18.—The show of wool at this day's market was enormous, the largest ever known by "the oldest inhabitant." Upwards of 1,400 sheets were pitched, of a value which we may estimate at not less than £50,000. Notwithstanding this immense show, such is the repute of the York market, and the great attendance of buyers, that the supply was equalled by the demand, and a good clearance of the market was effected, with the exception of about 70 sheets, which remain over. The prices may be noted at about the same as those obtained last week, viz., 22s. 6d., 23s., 23s. 6d., 24s., 24s. 6d., 25s., 25s. 6d., 26s., 26s. 6d., and 27s. per stone, according to breed, quality, and count of hog and ewe fleeces. There were only two or three lots of Moor wool exhibited at the market to-day, and which sold at 1s., locks 1s., cotted fleeces 1s. 3d. to 1s. 4d., mixed 1s. 2½d. to 1s. 3d. per lb. There were some extraordinary fine lots, which even exceeded our highest quotations. Mr. Thompson, of Mount Pleasant, Beverley, exhibited 70 sheets of wool, including the clip of Mr. R. Dugleby, of Cawhill (450 hogs and 350 ewes), which, for cleanliness, fineness, and condition, commanded universal admiration. The purchasers were Messrs. Clough and Son, of Stetton, Keighley, for a long price—we heard close upon 2s. per lb. Mr. Woodcock, of Slingsby, pitched 47 sheets of very fine wool, which was sold to Messrs. Denby and Sons, of Shipley, at a slight advance on our top quotations. The same firm bought a very large parcel of 67 sheets of Mr. Pickering, of Cherry Burton, at we heard, 27s. 3d. per stone. There were many other very prime parcels of wool in the market, and, as in quantity so in quality, the present show was unequalled. The market was one of considerable interest, and both buyers and sellers appeared well satisfied.—*Yorkshire Gazette.*

LIVERPOOL WOOL MARKET.—June 20.

SCOTCH.—There is no alteration to report as regards laid Highland. Stocks are exceedingly light, and at present high rates consumers only take for their immediate requirements. Laid Cheviots none in the market. White wools, such as bred and half-bred, very little have come to market; but the rates for these will be fully 10 per cent. higher than at last clip.

	s. d.	s. d.
Laid Highland Wool per 34lbs.	17 0	18 0
White Highland do.	21 0	22 0
Laid crossed do. unwashed....	20 0	21 0
Do. washed.....	21 0	22 0
Laid Cheviot do. unwashed....	22 0	24 0
Do. washed.....	24 0	26 0
White Cheviot do. washed.....	26 0	28 0

FOREIGN.—There has been a moderate demand during the past week for useful long-stapled wools. There will be brought forward on the 28th of June, by public sale here, about 2,000 bales washed lustrous Ricos and Buenos Ayres wool, and 500 unwashed, which will no doubt draw the attention of the trade to this class.

BRESLAU WOOL REPORT, June 18.—Owing to the absence of purchasers, who are attending the other Prussian fairs, business here has been confined to the narrowest compass, and only a few flocks of Posen fleeces changed owners at the established advance. From the Posen fair further advices state that the second and third market-days passed with less briskness, and that the increase of 4 to 7 per cent. which had been allowed in the beginning, later turned to a decline of 3 to 5 per cent. below last year's quotations. But it must in the meantime be mentioned, that in these instances washes and conditions of the flocks have been deficient. From Landersberg and Stettin we learn that these fairs equally opened with great liveliness, and that good-washed fleeces were rapidly picked out at an increase of 4 to 6 per cent., but that the conclusion was rather less animated, and bad-conditioned wools had been left unsold. The chief purchasers at these fairs were Hamburg, English, French, and Swedish firms, as well as the members of the Zollverein, who have been dealing very largely.—**GUNSBURG BROTHERS.**

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from the importers' stores, or ex ship (30 tons), £12 5s. to £12 10s. per ton.

Bones, £5 to £6 5s.; crushed, £8 10s. to £9 15s. per ton.
 Animal Charcoal, £4 15s. to £5 10s. per ton.
 Coprolite, Cambridge, (in London), whole 50s., ground 60s.; Suffolk whole 42s., ground 57s. per ton.
 Nitrate of Soda, 14s. to 14s. 10d. per cwt.
 Sulphate of Ammonia, 15s. per ton.
 Sulphuric Acid, concentrated 15½d. 1d. per lb., brown 17½d. 0d.
 Superphosphate of Lime, £8 5s. per ton. Fishery Salt, 35s.
 Blood Manure, £6 5s. to £7 10s. per ton. Dissolved Bones, £6 15s. do.
 Dissolved Coprolites, £6 15s. per ton.
 Linseed Cakes, best American, £10 10s. per ton, ditto £10 to £10 5s. per bag, English, £10 5s. to £10 10s. per ton.
 Rape Cake, £5 15s. to £7 per ton.
 Cottonseed Cake, £5 15s. to £6 5s. per ton.

**E. PURSER, London Manure Company,
116, Fenchurch Street, E.C.**

LIVERPOOL SEED AND GUANO, &c., MARKET.

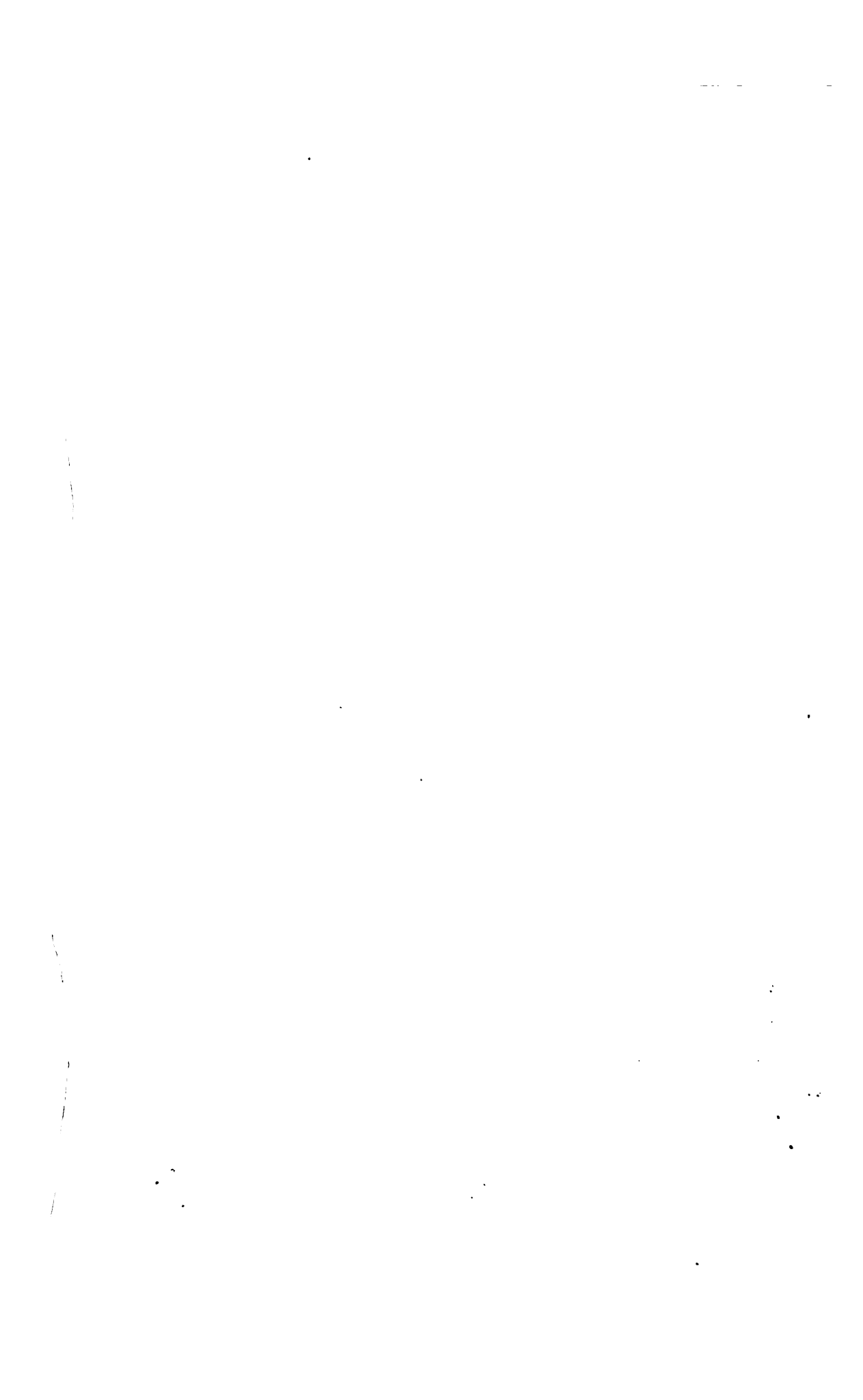
Guano, Peruvian £12 7 6 to £20 0 0, Linseed Cake, per ton—
 Do. Upper do. 6 7 6 to 0 0 0 Americ. thin bgs. £9 0 0 to 9 5 0
 Patagonian 0 0 0 0 0 Do. in brie. 0 0 0 0 0
 Kooria Moorina 3 10 0 0 0 English 0 0 0 10 0
 Bone Ash 4 15 0 5 0 Cold. Cake, decort. 7 15 0 0 0
 Saltpetre, Bengal, ... 0 0 0 0 0 Grimstone, 3d & 5d 6 0 0
 2 per cent. 0 0 0 0 0 Nit. of Soda, p. est. 0 0 0 0 0
 Cloverseed, new 0 0 0 0 0 Lind. Bomby. p. gr. 3 13 3 3 6
 red, per cwt. 1 15 0 1 15 0 Tallow, 1st F.Y.C. 2 8 0 0 0

**SAMUEL DOWNES AND Co., General Brokers,
Exchange Court, Liverpool.**

Agricultural Chemical Works, Stowmarket, Suffolk.
 Prentice's Cereal Manure for Corn Crops per ton £8 10 0
 Mangold Manure " 8 0 0
 Prentice's Turnip Manure " 6 10 0
 Prentice's Superphosphate of Lime " 6 0 0

Manufactured by Hodgson and Simpson, Wakefield, and
 Matthews and Co., Driffield, Yorkshire.
 Nitro-Phosphate per ton £6 10 0
 Ammonia-Phosphate " 9 0 0

Printed by Rogerson and Tuxford, 346, Strand, London, W.C.





Mountain Sheep.

From a sketch by the artist, and the author's own observations.

Published by the author, 1877.



For Sale.
A thoroughbred filly the property of J. E. Maylor Esq.
London, Published by T. Agnew & Sons, 15, Abchurch Lane, 1861.

PLATE III.

EXMOOR WETHERS.

THE PROPERTY OF MR. JAMES QUARTLEY, OF MOLLAND, SOUTH MOLTON, DEVON.

These wethers made up the medal pen of Mountain sheep at the last Smithfield Club Cattle Show, where they beat another capital lot of Mr. Smith's, of Southernoy, Exeter, entered as "White-faced Mountain," while Mr. Quartley calls his Pure Exmoors. Molland has long been famous for both its herds and its flocks, and Exmoor of late years has become very familiar to the agriculturist for its several breeds of stock. The history of the prize wethers, however, is soon told, as they were bought in the Islington Hall by Mr. S. Hine, of Stonehouse, who took them back westwards.

PLATE IV.

FEU-DE-JOIE; A THOROUGH-BRED FILLY.

THE PROPERTY OF MR. R. C. NAYLOR.

Feu-de-Joie, bred by Mr. J. Williamson, in 1859, is by Longbow out of Jeu d'Esprit, by Flatcatcher, her dam Extempore, by Emilius—Maria, by Whisker.

Longbow, bred by Lord Derby in 1849, is by Ituriel out of Miss Bow, by Catton. His stock first came out in 1857, when he opened with Toxophilite and Longrange. He is also the sire of Smut, Twang, Bopeep, Streamer, Medallion, Baron Munchausen, Longshot, Miss Lancashire, Broad Arrow, Sagitta, winner of the Thousand Guineas Stakes, and Feu-de-Joie, winner of the Oaks.

Jeu d'Esprit, bred by Mr. Williamson in 1852, went to the stud in 1856, and threw her first colt, Convivialist by Teddington, in the following

spring; with the Oaks filly as the next, and another by Tom King in 1860. The mare is still in Mr. Williamson's stud at Whitefield, near Liverpool.

Feu-de-Joie is a mealy chesnut filly, standing just about fifteen hands high. She has a sweet head, with rather a long ear, a bright eye, and a tapering nose. Then she arches her blood-like neck, which runs into a beautiful shoulder; while deep girth and ribs, a good back, and strong thighs and quarters go to complete her points. But she is small in the bone, especially before, and withal but "a neat little one." Mr. Naylor purchased Feu-de-Joie when a yearling at Doncaster for 250 guineas.

SEWAGE IRRIGATION.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

It has been correctly enough remarked, that it is only by very slow degrees the public is convinced of the value of any suggested improvement. It has been, indeed, somewhere calculated that a quarter of a century should commonly be assigned as the necessary period for such a conversion. The treatment of the sewage matters of our towns is a fair illustration of this assertion. It is now about that period since the waste of town-sewage was first energetically denounced, its value for irrigation shown, and its pernicious effect on our river-waters proved. It was then that its use for grass land, when applied in copious quantities, as instanced in the case of hundreds of acres at Edinburgh and elsewhere, was advocated.

Then arose, as a matter of course, great opposition to its employment, or even to its diversion from our rivers; its value was ridiculed, its use denounced as profitless, and even pernicious to the public health. Then came a little flight of schemers, who were provided with deodorizers and precipitants; these, as a matter of course, all failed, since what they precipitated from the sewage consisted only of its mechanically suspended matters, the portion of sewage of the least fertilizing value, whilst the chemically-combined portion of the sewage still remained in solution.

Then there was another class of improvers who applied the sewage to the land in the state in which it was discharged from the sewer; but then they applied it either to land ill-adapted for irrigation, or they bestowed the sewage in quantities far too small for a remunerative result. Some used iron pipes to convey it to their land, and distributed it over their fields by hydrants and hose; in other cases it was squirted over the surface of the ground in a way still more parsimonious.

Time has by degrees led us all to arrive at a far more correct conclusion, viz., that sewage is best applied to grass, and in quantities not less annually than from 5,000 to 6,000 tons per acre.

Thus, to give an instance or two, as Mr. Lawes remarks (*Royal Ag. Soc.*, vol. xxiii., p. 67): The Earl of Essex, who rents the sewage of the town of Watford, had laid down pipes for its application over 210 acres of mixed arable and grass land; but he has been led by experience to limit the application to but a small proportion of that area, and almost exclusively to either permanent meadow or Italian ryegrass. Indeed, in his evidence before the Committee of the House of Commons last year, his lordship stated that practically he limited the application to about 10 acres of Italian ryegrass and 35 acres of meadow land; for the former of which he required about 5,000 tons per acre per annum, and that for the latter the amount remaining at his disposal was inadequate.

At Rugby, about 6,700 of the population contribute to the sewage, and pipes were laid down for its application to about 470 acres of mixed arable and grass land. The quantity of sewage pumped daily (which is by no means the total yield of the town) averages about 750 tons, and, reckoning 300 working days, this gives a supply of 225,000 tons per annum. If this amount were equally distributed over the 470 acres piped for its application, the supply would be something less than 500 tons sewage per acre per annum. But when the Royal Commissioners first visited Rugby, in order to arrange with Mr. Walker, the proprietor of the land and of the sewage works, and

with Mr. Campbell, the tenant of about 190 acres for the use of a few acres of the land, and a supply of sewage, they found that the practical experience of some years had led to the limitation of the application almost exclusively to grass, and also, in a great measure, to the abandonment of the use of the hose and jet, and the substitution of open runs. The sewage instead of being applied to 470 acres of mixed arable and grass land, was limited to but a fraction of that area; and Mr. Campbell, who had pipes laid down for about 190 acres, and was paying rent accordingly, had abandoned the use on all but about a dozen acres of permanent meadow or Italian ryegrass.

Neither Mr. Campbell nor the present or previous tenant of the other portion of the land laid out for sewage irrigation at Rugby, was examined before the Committee of the House of Commons last year; but in a pamphlet since published by the former gentleman, giving the results of his experience for eight years as a sewage farmer, he states "that he should expect a better-paying return from 50 acres with 4,500 tons per acre per annum than from 100 acres with 2,250 tons per acre."

It being, then, established that the copious watering of grass with sewage is a profitable mode of employing this liquid manure, let us next inquire how that application can, in favourable situations, be extended.

It is needless to remark upon those cases where the mouths of town sewers are at such an elevation that the sewage discharged from them can be directed by its own gravity on to neighbouring meadows; in those cases, no doubt is entertained of the great value of sewage for irrigation; let us rather confine our attention to those many places where the choice of discharge is confined either to the use of the river or the pump. Now I take it that, in considering the application and economy of applying sewage by the steam-engine, the true course has not been usually followed. The value of the foreign matters of sewage has alone been estimated: the importance of the water has been disregarded. Let us, then, begin in an opposite direction, and trace the cost of merely raising so much clear water, as from a stream or a well, before we value the foreign matters we may find in it, and we may perchance be led from the result to suspect that, by means of the best engines, much may yet be done in irrigation by the landowner, or by an association of landowners, in many districts, to increase the rent-roll of the estate.

Now let us not take cases where nature may have aided us, or refer to distant places; but let us look around our own district for information. A few hundred yards only from where I am now writing, two capital Cornish steam-engines, erected by the Vivians, of Redruth, are quietly raising water from a well into a reservoir, from whence all the town of Croydon is supplied. The height which the water is lifted is about 180 feet—an elevation far exceeding anything likely to be needed in sewage irrigation. And what is the cost of this pumping? It is as follows:—In the year 1862, about 260,000,000 gallons, or say about 1,165,000 tons were raised at an expense of £794, exclusive of wear-and-tear, and outlay for interest of capital. Some of the items, of which this £794 was composed, so far exceed what would be needed in a private owner's case, that perhaps about £800, it may be fairly regarded, would include all expenses in the case of an irrigating operation. These items were as follows:—

Wages	£388
Coals	325
Tallow, gas, and oil	108
Composition for boilers	23 — £794

If then, we have to raise the water even 160 feet, we see that it may be raised for about £800. Now, if 6,000 tons of water is annually applied to an acre of grass, then these 1,165,000 tons would suffice for about 185 acres. So that if the water was raised to that height, 6,000 tons would cost about £4 per acre; if the water had to be lifted only 80 feet it would cost about £2 per acre; if only 40 feet only about £1 per acre. Now, there is, perhaps, little doubt that the application of only river water to an upland pasture, at such a cost as this, would well repay the holder for his outlay. It would be equal to a yearly rainfall of 60 inches over and above what dame Nature bestows upon the soil; and if so, then the other things being the same, all the foreign matters added to the 6,000 tons of clear water must be an extra gain to the irrigator. What are these impurities of sewage? what their value to the land?

On this portion of our inquiry, let us hear Dr. Voelcker (who is by no means inclined to overrate its value); he remarks (*ibid.* vol. xliii., p. 462), when speaking of the sewage of different towns, that he found of foreign matter in a gallon of the sewage of Birmingham on an average nearly 70 grains; sometimes a little less, sometimes a little more. We must naturally expect such variations. Dr. Wrightson also found there were about 70 grains; and in the sewage of other towns, the average of solid matter is seldom much higher than 80 or 90 grains. Even in the most concentrated sewage of Birmingham the amount of solid matter is, as I know, seldom higher than 105 grains. On the whole, then, I believe we are not far wrong in stating that town sewage contains on an average one part of solid matter in a thousand.

Let us inquire, in the next place, into the character of the solid matter. Messrs. Hoffman and Witt estimated that the 102 grains which, according to them, are found in the imperial gallon, consist of—nitrogen, 6·7; phosphoric acid, 1·8; potash, 1; organic matter, 30·7; or a total quantity of 40·2 grains of fertilizing matter—the remaining 62 grains being worthless. Supposing a gallon of London sewage to contain 90 grains of solid matter—an over-estimate, which I take, that I may be certain of dealing fairly with sewage—the following table will fairly represent its average composition:—

		One ton of the Dry	One ton contains	Constituents of Sewage contains
		lbs. ozs.	lbs.	
Organic matter and salts of ammonia		1 0	747	
Yielding ammonia . . .	7 grains	0 8½	168½	
Mineral matter		2 0	1498	
Containing—				
Phosphoric acid	1 grain	0 0½	23	
Potash	8 grains	0 1½	69	
Worthless matters . . .	56 grains	1 14	140	

I find then, in these 90 grains, 30 of organic matter (including 7 grains of ammonia) and 60 of mineral matter, and that in this mineral matter the valuable portion, the phosphoric acid, amounts to 1 grain, and the potash to, at the maximum, 3 grains. In a ton of sewage we have 3½ lbs. of salts of ammonia, 2 of mineral matter, and in this mineral matter half an ounce of phosphoric acid, 1½ of potash, and nearly 2 lbs. of worthless matter. A ton of the dry constituents of sewage contains 168½ lbs. of ammonia, 23 lbs. of phosphoric acid, 69 lbs. of potash, and nearly two-thirds of it is worthless matter. So that

taking these to be the amount of foreign matters contained in sewage, if we apply 6,000 tons, we shall in that quantity apply to the land about 8½ tons of solid substances, containing about 2½ tons of organic matters and salts of ammonia, the value of which must assuredly form a very considerable item, when we are considering the economy of employing the pump for irrigation purposes.

Then, as to the practical results of thus applying sewage. Not more than 1½ miles from my house are the sewage-irrigated meads of Beddington, held of the town of Croydon by Mr. Marriage. He uses the sewage on many acres of land, and he labours under the disadvantage of being under contract obliged, in all seasons, in dry weather or in flood, to purify by irrigation, all the sewage of Croydon, a town of 18,000 persons. Yet, notwithstanding that his land is often obliged to be needlessly irrigated, what does he say, when writing to Mr. Mechi, (*Farmer's Mag.*, vol. liii., p. 335)? :—

That he pays £1,500 annually for the 300 acres. The former rental, before the sewage was applied, was under £2. The cost of levelling, making the carriers, &c., is about £5 per acre, £3 of which was allowed by the town of Croydon. The ground is very level, with a gentle slope; and thus the expense of laying out has been small. The inhabitants of Croydon are about 28,000; but he only gets the sewage from 18,000, or about 60 persons to the acre. This, he thinks, is an ample supply; and he knows, from experiments tried, that, although the water passes from his land quite clear, it still contains a great deal of fertilizing matter. He only gets the fluid excrements, the solid being arrested by filter-beds. He would prefer having the whole. The sewage is mixed with a daily supply of water equal to one million gallons, to which must be added the rainfall and drainage from springs that ooze into the pipes, and increase the quantity to two million gallons. The sewage goes on winter and summer. The first cut of grass was last year, the 10th of April, and it was continued up to the 7th of November, being nearly all sold to cowkeepers, &c., who are now beginning to appreciate the advantage of using it. He continued to cut it for his own cows until the 27th of November. Although the meadows are newly sewaged, he reckons the produce at 32 tons per acre; this, if dried, would represent about 9 tons of hay. He differs with Mr. Lawes as to the grass not having fattening properties. Some bullocks which he turned out gained flesh twice as fast as they would have done in Essex pastures. He fed forty of his own cows, from May to the end of November, with the refuse grass only, which he did not send to market. They were in full milk, and gained considerably in condition, although they had nothing but the grass, and, being stall-fed, lay on the bare bricks, he having no straw for them. He is, with me, of opinion that a ton of this grass is worth much more than a ton of mangel (for which the cowkeepers pay £1), as it contains twice as much dry matter. Mangel-wurzel alone would destroy cows by purgation; while the sewaged grass alone gives milk and condition. He calculates that the meadows will improve annually for some time, as this is only their third year of sewaging.

I think, then, from these facts, we may assume, 1stly, that in many more localities of our country than is commonly believed, even clear river-water may be profitably lifted by the pump for irrigation; and, 2ndly, the profit is still greater when sewage is substituted for mere water; and, 3rdly, that grass is the crop to which it should be applied; and, 4thly, that not less than 5,000 to 6,000 tons per acre should be annually poured upon the land. If we are correct in these conclusions, then, we may well be glad, not only that our fields may be thus rendered more valuable, but because our streams will be purified, and our atmosphere rendered more healthy.

THE AGRICULTURAL VALUE OF PHOSPHATE OF LIME.

Under the system of agriculture commonly adopted phosphate of lime is continually being abstracted from the soil, and unless an equivalent portion to that which is taken is liberated from the land by annual decomposition, or is returned by the purchase of manure containing it, a gradual diminution of fertility must follow. Phosphoric-acid enters into the composition of all plants and animals, and is found in all soils not absolutely sterile. The inorganic parts of the bones of all animals are composed principally of this acid united with lime, and all cereal grains contain from 40 to 50 per cent. in their ashes. It will easily be seen, then, that it is a substance of vast importance in an agricultural point of view; particularly when it is understood that no plant will grow in ground destitute of such an ingredient. The whole of the phosphate of lime which exists in the bones of man and animals must have been originally in the soil, and being taken up by plants was by them conveyed into the animal organism. Common experience proved the value of bones as a manure, but science had to explain the cause of their beneficial action. This science not only did, but having done so, discovered a plan to decompose these bones before they were applied to the soil, thus producing a better immediate effect with a twentieth part of the bones.

There are small phosphoric-acid and lime compounds known to chemists, but the principal ones are the natural phosphate of lime, often called the bone-earth phosphate, because it forms the chief earthy ingredient of bones, and the biphosphate, or, as it is called in common, superphosphate or acid-phosphate of lime. The former contains 48½ per cent. of phosphoric acid, and 51½ of lime. The latter 71½ per cent. of phosphoric acid, and 28½ per cent. of lime. The neutral phosphate of lime is all but insoluble in water, but the biphosphate is readily soluble. Now, what science has discovered is the method of cheaply converting the insoluble phosphate into the soluble biphosphate; and, simple as it may seem, this discovery has benefited agriculture more than all others combined. Superphosphate of lime has a magical effect on the growth of the turnip, frequently increasing the crop sixteen-fold. In this country, phosphate of lime is obtained from some of the common guanos, animal charcoal, or calcined bones which have been used in the refining of sugar, and from coprolites. There is a mineral phosphate of lime—apatite—which have been known to exist in Estramadura in Spain for a long period. The price is, however, yet too high for commercial purposes. In the United States one of the richest veins of almost pure phosphate of lime was discovered some years ago in Essex county, New York. Mineral phosphate of lime, provided it contain the same amount of phosphoric acid and no deleterious substances, is just as good as that obtained from bones, when both are made into superphosphate of lime.

The composition of bones varies considerably, according to the age and kind of animals, less phosphate of lime and more gelatine being found in an old animal. Beyond the phosphate of lime, bones contain 38 per cent. of organic matter; so that in judging of the results of experiments with fresh bones, it is necessary to take this into account, and not to attribute all the benefit to the phosphate.

From the result of carefully-conducted experiments we may draw the following important conclusions: that if, in ordinary agriculture, the turnip is supplied with available

phosphate of lime, no other substance need be employed of a mineral or alkaline nature; that ammonia is not essential; but that carbon, in conjunction with phosphate, will give an increased crop over the phosphate of lime.

Some useful sources of phosphate have recently been discovered in Belgium. In a pamphlet entitled "The Production of Nitrates and their Application to Agriculture," M. P. Bortier, a farmer of Ghestelles announces the existence in Belgium of deposits of chally marl, which are found very useful in improving fertilizers. There exist in Europe, but three deposits of this coral limestone as it is termed, which are situate in Belgium, extending to Holland. Mr. Hardy, of Beaulieu, an eminent economist, and formerly professor of mineralogy at Mons, knew of this marl of Ciply, and the deposit is indicated with mathematical precision in the excellent geological map of M. Dumont, the learned professor of Liege, who gave it the name of coral limestone. M. Omalius, of Halloy, in his admirable work "The Geology of Belgium," the fruit of fifty years' study and research, has given a detailed description of three deposits of this coral limestone in Belgium—at Ciply, Folx-les-Caves, and Lanayes.

We also find in the excellent work of Mr. Binkhorst (a geological paleontological sketch of the cretaceous beds of Lembourg), a good description of these coral limestones. This geologist has given us a chemical analysis of a substance so important in an agricultural point of view, which shows the presence of phosphates in the marls.

The following is the per-centage—

Carbonate of lime	...	...	96.00
Carbonate of magnesia	...	...	1.46
Phosphate of lime	...	...	1.10
Peroxide of iron, alumina, and silica	...	...	1.44
Soda	...	...	traces
100.00			

Richness in carbonate of lime, porosity, friability, the presence of phosphates and traces of soda, are qualities of considerable value in an agricultural point of view. M. de Gasparin would seem to have had under his eye this limestone when, in his "Course of Agriculture," he wrote as follows: "The pulverulent marls furnish nitrogen: sometimes they contain nitric acid. It is evident that by their exposure and efflorescence they are susceptible of becoming loaded with the elements of fertility. Exterior agents have no influence on the marl in forming nitrates on the surface." This theory we find confirmed by a learned professor, M. d'Archiac, who, in his "History of the Progress of Geology," says "there was collected at Folx-les-Caves a great quantity of saltpetre, which was used at the time of the wars of the Empire." Folx-les-Caves is one of the three natural deposits of coral limestone of which we have just spoken. If, then, saltpetre is formed naturally by this limestone without atmospheric influence, in what proportion would this same saltpetre form nitre by the ordinary scientific processes employed? The great facility with which it nitrifies has led to its being called nitrifying marl. A specimen of this marl, and of the manure which led to this nitrification, was shown in the Exhibition last year under the name of Preparation of Nitrate of Lime.

The coral limestone deposit is of recent formation, and is generally found seated on or above the white chalk. All geologists agree that there are only these three deposits in

Europe, and that the beds are inexhaustible. Owing to the facility of communication, it may be supplied to France, England, and Germany for agricultural use. Hitherto, the only purpose to which it has been put has been in the form of powdered stone for scouring kitchen-tables in Mons. The continental agriculturists are now turning their attention to the application of the nitrates to a more useful object than the destructive art of war. Well might M. de Gasparin observe: "There is not a single agricultural practice, a single process of art, which may not become the object of curious and useful research, the happy results of which may entirely change the face of the industry."

The application of artificial manures to various agricultural crops is a subject of great interest and importance, and one that has received much attention in this country. It has been supposed that a knowledge of the composition of plants, especially of their ashes, would enable the scientific agriculturist to apply the proper kind of manure, and that the crop would increase or diminish in exact proportion as these ash-constituents were supplied or withheld. But this theory, however plausible it may appear, and though it has received the sanction of the highest scientific authorities, is scarcely borne out by common experience—the infallible test in all the great practical arts.

DO COMETS AFFECT THE WEATHER?

Popular belief has from time immemorial ascribed a singular and ominous importance to the appearance of a comet within the range of mundane eyes—an idea associated with the very earliest notions that have come down to us respecting the crude astronomy of the ancients, and one that found a place in the writings of sages as well as in the unreasoning minds of the masses. We may well imagine that the early observers at Babylon, or the still less cultivated spectators of the heavens, the Chaldean shepherds, whilst gazing upwards into the star-bespangled canopy of space, would behold with consternation the solemn harmony of the glittering orbs intruded upon by the unusual appearance of so large and luminous a body. It is not to be wondered at that these rude scrutinizers of the heavenly motions should connect with so startling an appearance some correspondingly-important phenomenon in worldly matters.

History furnishes us with more than one instance in which the sudden incursion of some large comet into our system decided the fate of peoples and nations; whilst in the writings of classical and modern poets the common idea of their baneful influence is frequently expressed. The well-known lines of Milton will no doubt occur to the minds of many—

"That fires the length of Ophiachus huge
In the arctic sky, and from his horrid hair
Shakes pestilence and war."

The vulgar are ever ready to assign some mysterious office to phenomena that they in their simple philosophy are unable to explain, and to attribute correlations between occurrences in the natural and moral worlds where none really exist, save in their own superstitious fears.

The progress of a more enlightened age, and the gradual development of a better knowledge of scientific truths amongst all ranks, have forbidden our masses to believe in the superstitions that kings and rulers bowed before, a few centuries ago. But for all our advance in popular education, we have without doubt much still to eradicate, and much to plant in its stead, before we can say that the element of superstition does not exist amongst us. As a case in point, many of our readers will no doubt remember the panic that was created in the minds of some persons, usually in rural districts, by the appearance of the beautiful comet of 1858; when its mild radiance inspired so much terror in the breasts of more than one person as to cause them to destroy themselves, whilst others sold their little property, and removed to distant colonies, in the hopes of there escaping from some undefined calamity that they felt assured was about to descend on mankind, but of the nature of which they had no definite ideas! And this took place so recently as 1858, and might again happen this year, should we be again visited by one of these brilliant strangers!

Although these of us who have any pretensions to ordinary enlightenment do not go so far as to believe that comets play any part in the disposition of worldly affairs, yet there is an opinion, widely spread, that they exert an influence on our atmosphere, modifying the weather, and thus indirectly affecting everybody.

Now there really is as little reason for supposing they make the slightest alteration in any of the elements as there is for believing the fables of the old judicial astrology. A little honest inquiry into the nature of comets, and their movements, will soon convince the unprejudiced student of their perfectly harmless nature.

Physical astronomy does not present a more interesting study than that relative to the constitution of comets, and to the purposes that they fulfil in the material universe.

Comets are not all of the same form, some having no trains or tails, but appearing like a mere blurred luminous spot; but they are easily distinguished from other bodies by their pale light, as well as by their different motions. All large comets are, however, accompanied by a luminous train, which gives to them their most remarkable appearance. The other parts of which they are usually observed to consist are the nucleus, a light spot situated in the head; and the coma, as it is termed—a hazy envelope surrounding the head. The material of which these bodies are composed is of the utmost degree of tenuity; indeed, it is out of the power of the chemist to produce in his laboratory a gas at all approaching the same degree of rarity. This remarkable feature of their construction was noticed as long ago as the time of Seneca, stars having frequently been seen through their substance. The more refined appliances of modern astronomy has also agreed that the translucency of cometic matter is so perfect as to offer not the slightest obstacle to vision. In proof of this we might adduce numberless examples from the records of astronomical observation; let one suffice. Sir John Herschel observed in Biela's comet, during its passage over a small cluster of stars of the seventeenth magnitude, a cluster that the slightest fog would have blotted out from the field of the telescope, but they continued visible through the comet, although the thickness of the interposing matter could not have been less than 50,000 miles! There is no apparent displacement either of the star's place, when seen through cometic matter, by the refraction of the rays of light proceeding from the star to the observer.

Whilst the inconceivable tenuity of comets is thus established, their bulk, on the other hand, is sometimes very enormous. Herschel found that the head of the comet of 1811 had a diameter of 127,000 miles; and that of the hazy envelope surrounding it, the same astronomer determined to be 648,000 miles! With these facts before us, it is not possible to suppose that comets can affect our atmosphere by their gravitating force, or that they would

do our planet any harm by the mechanical shock that would be produced by a dense body coming in contact with us. Indeed it is extremely probable that on some occasions we have passed through cometic matter. In 1851 a curious, dry, luminous fog was observed just before the appearance of the great comet of that year; and in previous years the same phenomenon had been observed, which philosophers have thought might be owing to our having entered the atmosphere of the comet. However this may be, we have an example of the harmless nature of them from seeing their effect upon other heavenly bodies, that in their eccentric courses they sometimes encounter.

Philosophers are divided whether or no the nucleus is a solid substance; but if it be so, which is by no means clear, it is certain that the masses of comets must be very small. In the year 1779, Texell's comet passed through the middle of the system of Jupiter's satellites, without in the slightest way interfering with the motion of those bodies. Perhaps some of our readers may ask, if comets do not appear to play any part in the economy of our globe, what is their office?—a question that we must confess we are unable to answer. It was thought by Newton that they might be the fuel supply of the sun and fixed stars, supplying the loss of vapours incidental upon evaporation. But when we enter upon such speculations, we get beyond the limits of sober reason, and have nothing whereon to build a theory, but the baseless fabric of a fancy.

But as the list of comets, with their times of perihelion passage, &c., from the very earliest times, has, by the labour of modern astronomers, been compiled with great accuracy, we possess other grounds for proving their non-interference with our atmosphere than those supplied by the reasoning already put forward. By tabulating the times of perihelion of all comets seen, say since 1815, and the particulars of the weather on and about the time of such passage, we shall get a direct evidence of any effect that they might have; or on the other hand, from being unable to trace any peculiar feature about those periods we might safely infer that none is caused by those bodies.

Annexed is such a statement, extracted from the best existing authorities. Let us first group the years, from 1817 to 1841, in which no comets came within the limits of our system, and see if those years are distinguished above others by their rainfall or temperature. We shall then have the following statement:—

	RAINFALL.	MEAN TEMPERATURE.
During 1817 ...	24.8 inches ...	48.9 degrees.
" 1820 ...	23.7 " ...	48.5 "
" 1828 ...	31.5 " ...	51.4 "
" 1831 ...	30.8 " ...	51.6 "
" 1836 ...	27.1 " ...	49.2 "
" 1837 ...	21.0 " ...	48.5 "
" 1839 ...	29.6 " ...	48.9 "
" 1841 ...	33.3 " ...	49.9 "
Sum ...	221.8 " ...	396.9 "
Mean ...	27.7 " ...	49.6 "

The years during which only one comet was visible, with their respective meteorological characters, were as follows:

	RAINFALL.	MEAN TEMPERATURE.
During 1815 ...	21.3 inches ...	50.1 degrees.
" 1816 ...	32.3 " ...	47.6 "
" 1821 ...	30.5 " ...	50.5 "
" 1825 ...	24.0 " ...	48.5 "
" 1829 ...	25.2 " ...	47.8 "
" 1833 ...	28.0 " ...	50.1 "
" 1834 ...	19.6 " ...	51.8 "
" 1838 ...	28.8 " ...	47.6 "
Sum ...	199.7 " ...	394.0 "
Mean ...	25.0 " ...	49.3 "

Two or three cometic bodies were visible during the following years:—

	RAINFALL.	MEAN TEMPERATURE.
During 1818 ...	26.6 inches ...	51.9 degrees.
" 1824 ...	31.6 " ...	49.5 "
" 1827 ...	24.9 " ...	49.7 "
" 1830 ...	27.2 " ...	49.0 "
" 1832 ...	19.3 " ...	50.2 "
" 1835 ...	24.9 " ...	50.4 "
" 1842 ...	22.6 " ...	50.7 "
" 1843 ...	24.6 " ...	49.8 "
" 1844 ...	24.9 " ...	48.6 "
" 1848 ...	30.2 " ...	50.2 "
" 1849 ...	23.9 " ...	49.9 "
" 1850 ...	19.7 " ...	49.3 "
" 1852 ...	34.2 " ...	50.6 "
Sum ...	334.6 " ...	649.8 "
Mean ...	25.7 " ...	50.0 "

Four and upwards were seen in the following years. In 1846 and 1847, eight and six were the respective numbers discovered:—

	RAINFALL.	MEAN TEMPERATURE.
During 1819 ...	23.8 inches ...	50.5 degrees.
" 1822 ...	22.8 " ...	52.2 "
" 1825 ...	22.0 " ...	50.8 "
" 1826 ...	28.0 " ...	51.1 "
" 1840 ...	18.3 " ...	48.5 "
" 1845 ...	22.4 " ...	47.6 "
" 1846 ...	25.8 " ...	51.2 "
" 1847 ...	17.8 " ...	49.7 "
" 1851 ...	21.6 " ...	49.1 "
Sum ...	197.0 " ...	450.7 "
Mean ...	21.9 " ...	50.1 "

It is evident, from an examination of these statistics, that the series is not sufficiently long to obliterate the effect of exceptional cases. It would at first appear, by reference to the first table, that the absence of comets caused the rainfall to be excessive, since the mean fall for those years gives us the largest amount; but on looking more closely at the matter, we shall find such an opinion to be by no means well founded. In 1837 we have a total fall of 21 inches only; and in 1841, the large one of 33.3 inches, both years being examples in which no cometic bodies were discovered. Again, in the last table, in which are grouped the years when four and more of such bodies were seen, we have an amount, in 1846, of 25 inches, and the following year only 17.8 inches; and yet both these years were distinguished above all others by the great number of comets which appeared. The means of the two other tables are too nearly alike to need any comment.

Now, let us look at the mean yearly temperatures, a much more satisfactory element for investigation, since it is not so singularly variable as that of the rain. Here the mean results are so nearly alike that for all practical purposes we may consider them identical. If we examine the individual results, we observe that the highest mean yearly reading is that of 1822, when we had a mean of 52.2 deg. During this year four comets were discovered. The lowest yearly reading occurs in this table also, viz., for 1845, when there were the same number of comets observed. This same reading also occurs twice in the second table, for the years 1816 and 1838.

HOW TO SOFTEN HARD WATER.—One-half an ounce of quicklime dissolved in nine quarts of water, and the clear solution put into a barrel of hard water. The whole will be soft as it settles clear.

OUR FLAX SUPPLIES.

Among the numerous commodities which contribute in one form or other to the clothing necessities of the human race, there is no single product of greater importance than the flax-plant. There certainly is no material susceptible of textile adaptation more closely identified with the progress of civilized man, or which has been so uniformly subservient to his wants, and which, through all the vicissitudes of climate, change of locality, and the various phases of his industrial, mercantile, and social career, has been so readily and so usefully converted into fabrics either by machinery or by hand.

The Russian empire, from its vast extent, abundance of fertile lands favourable to production, and capacity for improvement, with the aid of low forced labour chiefly performed by the ex-serf population, necessarily stands at the head of the flax-growing countries of the globe. There is probably one million and a-quarter acres under culture there with flax. The chief ports of Russia for the shipment of flax are St. Petersburg, Riga, Archangel, Narva, Pernau, Revel, Libau, and the ports of the Black Sea. A limited outlet is also made through the Prussian ports of Königsberg, Memel, and Pillau.

The total exports of scutched or dressed flax to all countries, from Russia, which in 1849 amounted to 85,745 tons, in 1860 were but 72,901 tons. The exports of seed, however, increased in the same period from 6½ million bushels to 9½ million bushels. Flax and hemp have long formed the two leading articles of Russian exports, to which, if we add oleaginous seeds, taken in the aggregate they exceed in value those of any other class of similar crops.

The diminished supplies of flax from Russia, owing to the disturbances in that country, and the increased demand for fibres for textiles to take the place of cotton, leads to increased attention being given to supplies of all kinds from India and elsewhere. Already in the first five months of the present year our exports of flax manufactures are largely in excess of those of previous years—exceeding in value those of the corresponding period last year by £660,000; and this is not only in piece goods, but in yarn and thread.

The supply of flax has hitherto been in a very unsatisfactory state as compared with that of the other raw materials for textile manufactures; for while cotton and wool have been increasing threefold, and raw silk has more than doubled, flax has exhibited nothing like a steady increase. In the year 1846, the quantity imported was 1,147,092 cwt., and in 1862 it was 1,798,351 cwt.

This shows an increase, it is true; but in 1861 it was only 1,333,679 cwt., while in 1849 it was 1,806,673 cwt. The imports for the first five months of the present year show a decrease, the quantity being 317,821 cwt., compared with 334,165 cwt. during the corresponding period of last year; so that there is no very strong ground for hope in this respect. This is an unfortunate state of things for the linen trade at this particular time. Now that there is such an increased demand for linens, that demand cannot be met, owing to a deficient supply of the raw material. Not only at home, but in all foreign markets, there is now an opportunity of extending the trade very largely; yet it cannot be done. The limited supply of flax, and its increased value, leave manufacturers in no better position than before.

Had those who are interested in the trade exerted themselves some years ago (as the cotton manufacturers have

done), we might now be in the receipt of a good supply from India. In that quarter already considerable progress has been made, but it is necessarily a work of time to establish the cultivation of flax in that country, though we have every confidence that ultimate success will attend the exertions now being made.

The entire breadth of flax cultivated in Ireland for the present season cannot yet be correctly given. It is pretty certain that it will exceed 200,000 acres. Very favourable reports are heard of the young crop; the early-sown lands present the most satisfactory appearance. Advancing prices in Russia and the great falling off in our imports from Riga—nearly 1000 tons—renders our home production a matter of greater importance. The cultivation of flax in Great Britain has never been materially extended, owing mainly to greater profits accruing from the occupancy of the land by cereals and other crops. In Scotland, there have been occasionally from 3,000 to 6,500 acres under crop with flax.

The demand for every description of flax is brisk at full prices, and, as manufacturers are very busy, there is every probability that prices will go higher. As there is no doubt that every year the supply from the Baltic will be less, it is urgent that more attention should be given to the preparation of it in India. Samples grown in India have recently come to hand of a quality that would fairly compete with the medium marks of Riga flax. Above all others, the thing most needed is an abundant supply of flax, and to procure this no exertion should now be spared on the part of the trade. The latter cannot maintain, and still less increase, without being sure of receiving from Russia or some other source an abundant supply of the raw material at a comparatively cheap rate.

In the absence of full supplies of flax, more attention is paid to jute, and the consumption of this article has never been so great as at present, while prices rule very high. The imports into London and Liverpool this year have been 27,300 tons, against 26,750 in the first six months last year; and there is a stock of 11,800 tons with about 16,800 tons afloat. The imports into France in the first five months this year were, however, only 1,671 tons against 2,711 tons in the corresponding period last year, and 4,088 tons in 1861.

The position of this article has now become one of very great importance; and there is no doubt that however large the import, the whole would be required for consumption. The high price of cotton has opened markets for jute fabrics, that have hitherto been supplied with cotton goods; and the articles being found to answer every purpose required, will maintain their position, even should cotton return to its former low price. It is asserted by the brokers that a range of £15 to £22 per ton for common to good may be depended upon, even should our supply be doubled.

Importers may now feel confident that this article will become a standard one, not subject to the great fluctuations of the past six years. We trust that now, when prices amply remunerative to growers and collectors may be depended upon, more attention will be devoted to jute, and that our imports may be reckoned by hundreds of thousands of tons in a few years. There is no article capable of being spun that can be supplied within many pounds per ton so low as jute, and present prices of flax, which must yet go higher, will also increase the demand for jute. The export manufactures of it are largely on the in-

crease, having been in the five months £136,756, against £60,607 in 1862, and £53,158 in 1851.

The imports of hemp thus far this year have been large, especially from Austrian Italy, which amounts to 75,405 cwts., against 56,525 cwt. in the corresponding period last year; from Russia the supplies have declined one-half, but from British India and other sources the

imports are larger. The quantity of Manila hemp received is double the quantity to hand in the first five months of 1862. There have lately been some large arrivals of that beautiful strong nettle fibre known as China grass, for which there will doubtless ere long be a good demand; but prices are yet too high for the general consumer.

OIL SEEDS.

Oil seeds and oil cake have frequently been treated in our columns. More than two years ago we drew attention to the increasing trade in oil-seeds and vegetable oils, and the cake resulting therefrom. The large supplies of mineral oils introduced do not seem to have much interfered with the constant demand for them, whether in regard to consumption or price, although animal oils and fats have been depressed. There are some oils received in large quantities which cannot be expressed here, but are more readily obtainable at the seats of growth and production, such as palm oil, cocoa-nut oil, olive oil, and several kinds of what are termed seed oils. But there are other seeds which can be received in bulk here for crushing, and of which the cake remaining after expression is of considerable value for feeding purposes for stock. A readily available, cheap, and useful compressed food for horses and cattle is of great importance in this country.

The fact of our imported oilseed cakes (exclusive of that made at home) averaging 108,000 tons annually in the last three years, is a proof of this. We believe, however, the field for oil-crushing is by no means fully developed. There are many new oil-seeds to be obtained in quantity, and many new localities for supplies to be explored.

Even of the two principal oil-seeds named, linseed and rape, we do not get anything like the quantity we require for the wants of our oil-crushers and the demands of their customers. Both have rather increased than diminished, and we could readily take more. But other countries are bidding against us. France and Germany and Italy now work up a good deal of oil-seed, and it would be well if our brokers and merchants would hunt up new materials. The importance of this trade, and the certainty of its future development to a much larger magnitude, are manifest from the great increase that has taken place in the consumption of vegetable oils, both in England and upon the continent, as shown by the amount of our imports of oil seeds, which have risen since 1847 from 487,035 quarters to an annual average, during the last three years, of 1,401,603 qrs.; whilst the annual export of seed-oils to the continent has grown up, during the past five years, from 16,250 to 32,000 tons.

The consumption of oil-seed cake has advanced in a still greater ratio, the import of foreign descriptions having kept pace with the extra supply from our home manufacturers, thus establishing the important fact that oil-cake is an article of permanent and increasingly extensive demand; and there is every reason to expect that England must become more and more a grazing country, owing to the high price of meat, and the disadvantage of competing in the growth of corn with countries more favoured by Nature for this purpose.

This statement is made without reference to cotton seed, which has increased in supply during the last few years more than ten-fold; and although an article but recently applied to oil-producing and fattening pur-

poses, the profits arising from its manufacture have been highly satisfactory.

The number of useful oil-seeds at present obtained in quantity is but limited, and the field of nature in this respect has scarcely yet been properly explored. Rape, mustard, and colza, flax and hemp-seed—beni and teel, or gingelly, or sesame (all of which names it respectively bears), and poppy-seed, are of scarcely any present commercial importance. Cotton-seed has of late years come more extensively into the market for oil. We pass over the more solid fats, or vegetable butters, expressed from their fruits in the countries of production, such as palm, cocoa-nut, shea, and mohwa oils. Ground nut-kernels are a special article of trade, which are more dealt in in France than with us. There are a few other seeds of minor importance, such as niger-seed, camelina, Madia sativa, and castor-seeds; while, on the Continent, the walnut, the olive, and other fruits, aid largely the oil supplies.

We would point attention to two new oil-seeds which we think might be obtained in bulk by a little attention. First, sunflower seed, which is grown in large quantities in Russia, and the seeds of a wild gourd common in parts of Western Africa, and yielding an oil known in Lagos and other parts of the coast as Eguse oil. Sunflower seed, as shown in the Russian department of the last International Exhibition, was priced, respectively, 2s. 11d., 4s. 5d., 7s. 5d., and 17s. 8d. per cwt., according to quality—black, striped, white, &c., seed. The yield of oil from this seed is considerable, and it is useful for many purposes. Where waste land is plentiful, no doubt this might become a plentiful crop. From 1,500 to 30,000 plants are grown to the acre; and, although the quantity of seed varies considerably, according to soil, climate, and production, yet an average of 50 bushels may be relied on, which would yield 50 gallons of oil, and about 14 cwt. of oil-cake, which is superior to linseed-cake for feeding stock. The stalk is also valuable for fibre, and, now that rags are becoming scarcer and dearer owing to the unprecedented demand for paper, it might be made useful for paper stuff.

The other oil to which we would draw attention is Eguse oil, obtained from the seeds of some species of gourds, which are not only held in universal esteem in parts of Western Africa, but constitute lucrative articles of commerce on account of their manifold economical appliances. The annual amount of produce recently furnished from the new sources of trade opened up in the distant countries of Yoruba, Lagos, &c., has been unusually great; and considerable attention has, therefore, been directed to a few of these products, the collection of which by the mercantile communities of Western Africa might prove sufficiently remunerative to answer for exportation to Europe. No doubt, however, can exist that not only these, but other indigenous commodities, now comparatively unknown and limited in utility, must in the course of time occupy no insignificant position among the exports from our African colonies and the trading ports there. The seeds of the many wild cucurbitaceous plants which

are so common in warm countries have, as yet, been very little utilized. These gourds are extensively grown on the country farms and waste tracts of land of many parts of Africa; and the Eguse seeds already mentioned are now profitably retailed by their inhabitants in the markets of Sierra Leone, where they are purchased with avidity as one of the standard constituents of various country dishes. Our attention was first drawn to these seeds by the exhibits in the Courts of the Exhibition last year from Liberia, Lagos, and the Niger; the oil pressed from them was of a very excellent character, of a rich golden hue, and of a somewhat pleasant taste.

Embedded chiefly in the central portion of the pulp of the gourd are numerous white, narrow, ovate, and compressed seeds, nearly an inch long, enclosed in a tough coriaceous coat. These seeds, in a fresh state, possess an agreeable nutty flavour, approximating to that of the young almond or hazel-nut. Their bland and nutritive properties render them very palatable adjuncts to the native edibles; and so highly are they appreciated, that a ready sale is invariably commanded in the localities where they abound. A few days after the gourds have been gathered, they are longitudinally divided into two equal parts, and either suspended from the roof over the fire, or exposed to the sun, to facilitate the evaporation of the fluid portion of the pulp. The seeds are then picked out of their fleshy beds, well dried in the sun, and preserved in covered calabashes.

The rude country process by which the oil is obtained is as follows: The seeds are first carefully divested of their external sheaths by gently pounding in a wooden mortar. They are repeatedly washed, cleansed from impurities, dried in the sun, and partially parched in a pot over the fire. Thrown again into a mortar, the whole are beaten into a rough pulp, and finally rubbed between two stones until reduced to a fine paste. This is strongly

compressed between the hands, when a certain quantity of oil oozes forth, and the paste frequently heated over the fire, until successive manipulations exhaust all further supply. The oil is allowed to remain for some time, to permit of its clarification. It is sold in Abbeokuta at from 2s. to 4s. a gallon, according to the produce of the season. When pure, it is an excellent substitute for salad oil, and is equally useful for the lamp, burning with a bright clear flame. It is about equal, for all ordinary purposes, to rape-oil, but the market price would hardly exceed Indian sesame or gingelly. For the lubrication of machinery, and other analogous appliances, its natural qualities are sufficiently valuable to merit attentive consideration.

The production of oil on an extensive scale from various vegetable sources has for the last twelve years brought all the blessings of comfort, healthful occupation, industrious habits, and civilization, in the place of wars, famine, and the slave-trade in the interior. The several African trading companies recently formed will all assist, by competition and capital, in aiding the development of African resources, by extending the production of old staples, and calling forth new ones.

When we consider the enormous extent to which the ground-nut has been brought into cultivation and commerce in Western Africa, there seems no reason to question that these common gourds could be as profitably and extensively cultivated on the waste lands of Africa, affording another plentiful source of oil.

About 12,000 tons of ground-nuts, worth £130,000 to £140,000, are annually shipped from the Gambia alone for oil; but Governor Darcy, in a recent despatch to the Colonial Office, states that he takes every occasion to urge upon the natives most seriously the necessity of not depending solely upon the ground-nut, which is a very precarious staple.

LANDLORD AND TENANT.

GREAT GALA AT WOLLATON HALL.

The picturesque mansion at Wollaton, near Nottingham, the seat of the Right Hon. Lord Middleton, was on Thursday, July 9, the scene of one of those old English holidays, which always rejoice the heart, and bind together in kind feeling and good fellowship all classes of society for the mutual welfare of the community.

At two o'clock the tenantry from the north assembled at the Leaton Lodge, and here the Wollaton troop of yeomanry, under the command of Captain Weightman, and accompanied by the band of the regiment, joined them. A procession having been formed, the body marched to the Hall, looking to great advantage as they passed under the magnificent old limes that formed the avenues. The procession marched to the north entrance to the Hall, where Sergeant Major Potter arranged them in lines at either side of the entrance. The subscribers and yeomanry (of whom the noble lord is the captain) then assembled in the great Hall, where the ceremony of presentation of the portraits of Lord and Lady Middleton was to be gone through. Lord Middleton sat under his portrait, and Lady Middleton on his lordship's left, under her ladyship's portrait.

The Worshipful the Mayor of Nottingham R. Birkin, Esq., who was accompanied by T. F. A. Burnaby, Esq., of Lanford

Hall, then advanced, and the former read the address—the three first paragraphs of which were as follows:

"My Lord,—I have the honour of appearing before your Lordship to-day, accompanied by a large portion of the tenants and professional gentlemen connected with your Lordship's estates, in order to give expression to the feelings of sincere respect and attachment which exist amongst us and the tenantry generally.

"It has been most gratifying to us to observe that the period which has elapsed since your Lordship's accession to your present exalted position has been marked by a course of policy, in which is wisely and generously blended a regard for the welfare of the tenantry, as well as for your Lordship's personal and family interests.

"While the numerous and extensive improvements already effected and still in progress are calculated to enhance the value of your Lordship's estates, they have afforded an opportunity, which your Lordship's kindly feeling has not suffered to pass unheeded, for securing results which are highly beneficial also to the tenants, who trust that your Lordship's experience hitherto may, in what remains for future accomplishment, serve to strengthen and, if possible, extend a principle

which has been proved to have been fraught with so much advantage both to landlord and tenant."

At the conclusion of the address his Lordship made a suitable reply, from which we quote the following noble passage:—"I must, however, own, that the welfare of my tenants and those connected with my estates has ever been uppermost in our thoughts, and it has been my most particular desire to improve those estates which it has been my lot to fall heir to. Many of you know how much they needed it, and I hope that by your patience and perseverance, and my untiring endeavours to do the best for you, that in due time all will be much benefited; and I must here express a hope, that those

whose farms have not hitherto come in for improvement, will not feel neglected, for, with the assistance of my agents, the Messrs. Moore, all shall be attended to in their turn, and according to their necessities."

A number of gentlemen and tenants were then presented by Mr. Moore. At the presentation, the graciousness and affability of Lord and Lady Middleton impressed every heart. The fatigue of shaking hands with so many was attended with no small amount of weariness; but her Ladyship went through the duty with a condescension and endurance of fatigue which challenged every admiration.

LEICESTER SHEEP AND SHORTHORN CATTLE.

A breed of animals is the variation of an established species, of which the marks of distinction have proceeded from the influences of soil and climate, the direction of the sexual intercourse, and the system of management that is adopted. The variations being accidental and contingent, are not definitely, indeed very seldom, and sometimes never, perpetuated in the progeny. The changes that occur in the exposure and management of the animal organisation, do in many cases very quickly banish the original type, which is everywhere changed into many varieties, and ultimately altogether disappear. This result has been well established in the vegetable world with varieties of plants which hold the type for a time, split into many appearances that are puny and deformed, and ultimately lose all relation to the primitive exhibition. The animal and vegetable kingdoms being closely related in laws and regulations, the same appearances and results are exhibited in the growths and organisations.

Naturalists find no difficulty in the natural arrangements of classification, till the descending order has come to "species," which is the lowest rank in the arrangement. In very many cases, the marks of distinction are insufficient to establish a permanent separation, the differences not being so strictly persistent for the purpose of an established division. Hence species and varieties become confounded, and in many cases uncertainties continue to prevail. The generic distinction is in most cases so sufficiently established.

The species of domestic cattle is a uniformly perfect genus, of which many varieties are seen, arising from the influences that have been mentioned. Each locality of soil and climate has produced a variety of animals identical with the circumstances under which the growths are raised, and possessing marks of distinction that have been attached and impressed from the earliest existence and have been continued from the first notices and records of agricultural history. These marks being long and durably impressed on the animal system, are most of them retained under any circumstances; the size and condition of the animal may be enlarged or diminished, but the chief marks will remain.

THE LEICESTER SHEEP

Are generally supposed to have proceeded from the amalgamation of the heavy lowland animal with the smaller hill sheep of Charnwood Forest. In a short time the progeny was dispersed by letting and purchase over the neighbouring counties and into many parts of the kingdom, forming a vastly improved

animal, and thought to be stereotyped from the forge of Bakewell. Purity of breed was all the vogue, or no intermixture with foreign blood, never adverting to the results of the influences of removal.

The importations into Northumberland quickly appeared in two varieties—the blue-caps, and red-legs: the former constituting the larger animal, and of superior vigour of frame, lengthy, and handsome, and well covered with wool. The red-legs were smaller in bulk, lower on the legs, very compact, with a flesh of much fat and less fibre. Each variety had its advocates, till both have disappeared, and there is now seen a medium-sized animal of much wool, of medium precocity, rather dull in aspect, a good shape, and forming a variety of sheep that is not exceeded in value and utility by any improved animals in the kingdom.

The Leicester sheep of Nottinghamshire are inferior in bulk, rather leggy, with delicate appearance, an open fleece of wool in curly piles, and a head, face, and eye heavy and dull, and not handsome in form. The ear is hanging and sluggish. The breeders of that county reckon the sheep of Northumberland not to be Leicesters at all: the accusation is retorted from the North; and both parties are right in their own opinion, as will be shown.

Among the many varieties that are now seen in the class of the so-called Leicester sheep, the true type of Bakewell is not found, as it gradually disappeared after the wide dispersion of the breed. In the county of Leicester, the most eminent breeders are found to possess varieties of their own production, which differ very much in their points and qualities, being large or smaller, open or close in the wool, dull or lively, short or scraggy-necked, heavy in the ear, or dull in the eye; face wide, or narrow, tapering to the muzzle; the bones flat, or arched. This remark extends over all the breeding farms of eminence. Very just exceptions have been made against the animals shown by Mr. Sanday, of Holmptierpoint being received as Leicester sheep, properly so called; the true type is wholly wanting in the leggy carcass, which is light and deficient in girth, wool open and in curly piles, neck long and scraggy, and rising from the shoulders; the head heavy, eye dull, and the face broad, looking downwards, instead of pointing forwards. These points are wide from the original type of short legs, wide and round barrel, back level from the tail to the ears, which are narrow, pointed, and agile; eye quick and lively, face wide betwixt the eyes, tapering to the muzzle, which points forward, with the neck surrounded by a ruff of

wool close round the ears; the wool on the body placed in shelves opening with the hand, closely covering the whole carcass. These points have nearly vanished from the present time.

The last remaining type of Bakewell disappeared with the sheep that were exhibited by Mr. Robert Smith, late of Burley-on-the-Hill, and the only remnant is now seen in the sheep of Mr. Feijumbe: the resemblance is faint, but the only remaining exhibition of the original type.

The sheep of Northumberland are of superior utility to those of Nottingham, being larger, more robust, closer in the wool, and of a more vigorous constitution. The sheep of the Marquis of Exeter are large, heavy, dull, and unsymmetrical in form, open and shaggy in the wool, with very protuberant arched frontal bones: points widely different from the type of Bakewell. The first show of Mr. Twitchell's sheep exhibited very fine animals, now degenerated into a sickly delicacy of appearance and form. Dull eyes dimmed with scum—open wool lying in curly piles, showing the skin—hind legs lean in the inside—a scraggy neck rising and not level from the shoulder to the root of the ears—face broad with arched frontal bones—neck bare of wool from the ears, and wanting in the ruff—a leggy gaunt appearance of carcass, cannot be received as the type of Leicester sheep, but only as improved animals that have no doubt all proceeded from the parent stock, and changed by the various influences of exposure. This consideration settles the disputed question about descent, purity of blood, and pedigree, of the varieties of the sheep.

The Southdown sheep and many other varieties have been impressed with the marks of distinction from time immemorial, and will retain the properties much more obstinately than the Leicester breed, which is comparatively a recent formation. But all varieties of animals are changed more or less by importation under different circumstances: Leicester sheep have been carried into Ireland, and in some few years the progeny is not easily recognised as the same animals in the breed. Such changes are the extremes, but are always certain to happen in a greater or less degree, in proportion to the circumstances that have been mentioned.

SHORTHORN CATTLE

Are in two varieties, from a cross of Yorkshire cattle with the Galloway animals of Scotland, and from being improved among themselves in the native locality of Teeswater. This last variety is seen in the cattle of Mr. Wiley, which show the unquestionable excellence of carrying most flesh on the smallest quantity of bone—the great and most valuable quality that can be possessed by any fattened animals. The other variety inherit much coarseness of bone from the Scotch beast, very large in the herd of Earl Spencer, somewhat reduced by Mr. Stratton, and still more by Col. Towneley. In most herds of Shorthorn cattle, the heavy coarseness of bone is found very largely in the fore-quarter.

This breed or variety of cattle becomes divided into many variations, as are seen in the case of Leicester sheep, and arising from the same causes that have been mentioned. No two herds are found in a strict likeness, and the sub-varieties are innumerable.

The breed of Hereford and Devon, like to the Southdown sheep, have been impressed with the marks of distinction from time immemorial, and will maintain them more obstinately than the Shorthorn cattle. But both breeds are most miserable failures when carried into Scotland, and used in the

best management which the country can afford. The colour and horn of the animal will always remain, but the carcass becomes puny and mitheriven, and dwindles into a comparative insignificance.

The mixed descent of the Leicester sheep and Shorthorn cattle possesses an adaptation, accommodation, and an acclimatisation, with circumstances, very much superior to the older impressions of the Southdown sheep, Hereford and Devon cattle, arising from the facility of being bent in a readier manner to external impressions. Hence arises the very promiscuous progeny in appearance and quality from these two sources, that are certainly great improvements in the animal system, but far removed from the original type. The truth has been most evident for a good many years past—that Leicester sheep and Shorthorn cattle were degenerating from the original types, and appearing in very many forms of quality and symmetrical production. This observation has been largely expressed, and will be enlarged as time progresses. It arises from natural causes which have been mentioned.

In the British Isles, a very large portion of the surface ground is incapable of being used for the fattening of animals, and a very considerable portion is of inferior quality, and fitted only for fattening purposes in a very small degree. All these higher and inferior grounds are fitted for the breeding of animals to the age of three years, and then to be carried to the low country to be fattened for two years on pastures and roots, as can be determined from the soils and climates. This division of purposes seems destined by the provisions of Nature; for, after all the lowland breeding that has been done, it is well known that highland animals are more remunerative to be bought and fattened, and the flesh is better in quality. For the milking purpose, the larger lowland animals will be required in dairies; but, in private use, the smaller breeds give better milk and butter, and better flesh when fattened.

Any farmer by using a judicious and careful selection of animals for the purposes of propagation can very easily rear a breed of his own, without any costly purchases, and which will enjoy the great advantages of the identity that always exists between the soil and its productions—this property is most valuable.

THE RIPENING CORN.

How sweet to walk through the wheat-lands brown,
When the teeming fatness of Heaven drops down!
The waving crop with its bursting ears
A sea of gold on the earth appears;
No longer robed in a dress of green,
With tawny faces the fields are seen—
A sight more welcome and joyous far
Than a hundred blood-won victories are.

Beautiful custom was that of old,
When the Hebrew brought, with a joy untold,
The earliest ears of the ripening corn
And laid them down by the altar's horn;
When the priesthood waved them before the Lord,
While the Giver of harvest all hearts adored—
What gifts more suited could man impart
To express the flow of his grateful heart?

A crowd awaits 'neath the cottage eaves,
To cut the corn and to bind the sheaves;
At length is heard the expected sound—
Put in the sickle, the corn is browned;
And the reapers go forth with as blithe a soul
As those who gained the Olympian goal:
And sorrowless hearts and voices come
To swell the shouts of the harvest home.

And there is a reaper on earth well known
Whose deeds are traced on the burial stone:
He carries a sickle more deadly and keen
Than e'er on the harvest field was seen;
He cuts down the earliest ears in spring,
As well as the ripest that time can bring;
The tares he gathers to flames are driven,
The wheat is laid in the garner of Heaven.

SEWAGE.

ANALYSIS OF THE EVIDENCE TAKEN BEFORE THE PARLIAMENTARY COMMITTEE OF 1862.

The THIRD Section of this Analysis of the Evidence taken before the Parliamentary Committee embraces the following points:

The varieties of soil to which sewage has been applied; the state of cultivation at the time; and the comparative merits of different soils for sewage application.

Lord ESSEX said that the land to which he applied sewage was a good loam on gravel, not requiring to be drained.

Dr. R. ANGUS SMITH, considering sewage not injurious to health when the gases were prevented from rising, advocated drainage. A good clay soil fairly drained for agricultural purposes he thought an admirable disinfectant.

Mr. LAWES did not think in the application of sewage the nature of the soil need be taken into consideration, so long as "there was proper means of getting rid of the residue of the water." Sandy land seems best suited to sewage; but in it there is greater waste of manurial ingredients than in clay, which better fixes them.

Professor J. THOMAS WAY said he preferred a soil neither too heavy nor too light. A sandy soil possesses little absorptive power compared with clay, while a heavy clay would be with difficulty penetrated, except it were well drained. A medium loam well drained is the best soil. Applied to bare sea sand the sewage soon makes a soil for itself, the disintegrated stones of the streets being washed down into the sewers and deposited on the land form a beautiful loam.

Mr. Alderman MECHI stated his soil to be "like bird-lime in wet, and like cast-iron in dry weather"—a yellow, plastic, clay: while such a soil would "take most care of manure," "light land is most suitable for rye-grass, from the facility with which roots can search the ground."

Dr. VOELCKER pointed out the suitability of light porous soils for sewage application. He could not advise its use on heavy clay, ill-drained and ill-cultivated, and thought all heavy soil best treated with solid manure. There were many parts of Mr. Mechi's farm to which he would not apply sewage. Where a good porous surface soil is preserved the year round, sewage may be applied, but not on soil which cracks, for in this case the manure runs through to the drains, and is from them discharged in a highly coloured state. "As six inches of clay soil will perfectly deodorise and decompose a heavy dressing of sewage, provided the soil and manure are well mixed, therefore, as a practical test, I would say that all soil from which the manure runs coloured into the drains is in an improper cultivation to receive liquid manures."

Mr. R. FOWLER, a valuer and farmer (using the sewage of Birmingham), said his soil was light gravelly, upon a hard stone, needing pipe drainage only in certain wet places, and free from rushes and water grasses.

Mr. J. T. BLACKBURN, an agricultural engineer, and farmer, said that, with sanitary views, the application of sewage could only be recommended on thoroughly drained land. He said the soil of the Lochend farm was "a nice loam on a gravel subsoil," but that "the sewage at Edinburgh is applied on clay and sand, and almost every description of land."

Mr. JAMES FENTON, Engineer to the Croydon Board of Health, speaking of Croydon, described the soil as a clay of medium strength, lying on gravel-clay a little too stiff to allow the facile percolation of water. The slope of the field is 20 feet in a mile.

Sir JOSEPH PAXTON, M.P., stated, as the result of his own experience, that strong sandy land requiring no pipe drainage was the best fitted to receive sewage.

Mr. EDWIN O. TREGGELLIS, an engineer and practical farmer, said that he had applied sewage with the best effects upon heavy clay land, both arable and pasture.

Mr. HENDERSON, farm bailiff at Colney Hatch Asylum, stated that sewage was there used on heavy clay.

Mr. SAMUEL CHRISTY MILLER, Proprietor of the Craigintiny Meadows, told the Committee that 40 acres

near the sea is a raw sand, that another 40 acres is a very strong clay; and that he had also a tract of fine loamy surface soil. The sewage he describes as "beneficial to all, but preferable for sandy soils." Pure water percolates freely through a sandy soil, and passes away to a lower level. He conjectured that the clay soil would require more sewage than the sand. It would run over the surface of the clay, and not penetrate as in the sand, so that though the application would be larger, the absorption would be less. An acre of clay soil would require a longer flow of water than an acre of sand. The difference between the produce from the clay, the medium soil, and the sand, is scarcely perceptible—the loam brings the earliest grass.

Mr. JAMES HOPE, a farmer residing near Edinburgh, said that the produce of the Craigintiny Meadows was better on the sand than on the clay, but best on the loam.

Mr. J. CHALMERS MORTON thought that a soil well drained, naturally or artificially, was best to receive any kind of manure, particularly sewage.

Mr. J. BENSON, speaking of the Duke of Bedford's sewage meadows at Tavistock, described them as consisting of loam, poor clay, and poor sand—"the best land (the loam) always giving the best crop." Sewage, however, in his opinion, is applicable to all soils. In the latter announcement, Mr. G. M'CANN, who uses the sewage of Malvern, quite agrees.

Mr. W. S. MILES described the land on which he employs sewage as deep, rich, porous, red soil lying upon magnesian limestone.

Mr. WM. WESTWOOD, accustomed to use sewage on the land attached to the Anierley schools, described the soil as a stiff London clay well drained.

The FOURTH SECTION of this Analysis embraces the following considerations:

When town sewage may be applied to land and to crops.

Lord ESSEX stated that he got 270 tons of sewage "somewhere" on his 210 acres of land daily. "Put it on when you like—it remains in the soil till it is wanted by the plants."

Mr. LAWES had applied sewage from March to October, with only a day or two's interruption, with perfect satisfaction. This is on grass land. "Arable land is not at all fit to receive liquid manure—neither the crops nor the land—at all times."

Professor WAY believed sewage to be of immense value merely as water, and that in rainy seasons the water is so objectionable that you would rather lose the manure than be obliged to have the water.

Mr. Alderman MECHI stated "with the exception of hard frost, sewage may be always applied." We apply our sewage we think with the most advantage on wet days. The great difficulty and the great objection generally raised against town sewage is that the large rainfall impoverishes it very much. Mr. Bazalgette, in a paper read before the Society of Civil Engineers, in 1857, states that in 1855 there were 226 dry days in the year, 90 days on which the average amount of rainfall varied from the smallest fraction to the tenth of an inch, 21 days on which from one-tenth to one-fifth of an inch fell, and 28 days on which there were heavy rainfalls. He saw no reason, with the exception of these 28 days, therefore, why the sewage of London should not be continuously and beneficially used on the land. He had been in the habit of applying sewage to corn crops in the spring.

Mr. JAMES FENTON had been accustomed to see 43,000 gallons of sewage per acre applied every day, and to be kept on the fields for a period varying from three to eight days at a time once a month, in winter as in summer. In wet weather the surface has been increased. This is at Croydon.

Mr. J. WHITE, M.P., said, "Whatever may be the latitude and longitude (and any one who knows China knows what an immense range there is), the practice is the same in the coldest as in the hottest part of China, which practice is the application of human excreta for the purposes of manure, and its application at different seasons, and always in a liquid

state. The Chinese manure the plant, not the ground, and they copiously apply it as long as the plant is growing."

Sir JOSEPH PAXTON, M.P., said that although plants in a dormant state through the winter make no use of the manure around them, the absorbent soil would preserve the manurial ingredients of sewage applied during this period.

Mr. EDWIN O. TREGELLIS said he thought there would not be a week in a year when he could not apply sewage with advantage. In the winter months he would apply it freely to old grass land, and to the Italian rye-grass almost continuously.

Mr. S. C. MILLER said: "The sewage flows constantly day and night; in the summer months irrigation goes on in the night; in the winter nights the sewage and water pass to the sea; in the summer months there may be a little more water put over the ground per acre than there is in the winter; but as far as we can find it practicable, we continuously irrigate, summer and winter." In time of flood, in consequence of the rising of the burn, the sewage is allowed to run to sea, "otherwise the soil would be washed away."

Mr. PHILIP W. S. MILES stated that he applied the sewage whenever he got it.

The FIFTH Section of this Analysis embraces all evidence that replies to the following question:

Is town sewage likely to be injurious to land or to crops from any of the ingredients which it contains?

Dr. R. A. SMITH, who had investigated the impregnating matters of river water, seemed to say that the colouring matters principally cast out from the Lancashire mills—logwood, indigo, and wood, &c.—are innocuous. He did not consider plants likely to be injured by the weak solutions of poison found in the sewage of manufacturing towns. Copper and arsenic have been absorbed by plants without palpable injury to them. "I do not think that any ingredients which are detrimental ever escape in very great quantities; and for this simple reason, those which are very detrimental are generally strong chemical agents, and strong chemical agents are too expensive to throw away; the only one that is really detrimental which escapes near Manchester is, I think, muriatic acid, and that, of course, is preserved as much as possible."

Mr. LAWES confirmed the evidence by saying that the sewage of Rugby, Edinburgh, and London would, if analyzed, give pretty much the same result; the difference of the ingredients in the various staple manufactures would not with difficulty be ascertained.

Dr. A. W. HOFMANN stated his belief, having analysed the sewage of London, that it contained nothing injurious to vegetation, or that would neutralise the fertilising constituents of the soil. In the case of a small manufacturing town a detrimental effect might be produced upon a shallow stream; but in a town like London an individual manufactory, or even a number of manufactories, would not materially affect the nature of the sewage. He did not think the vitriol voided into the river at Birmingham would deteriorate the sewage to any appreciable degree.

Professor J. T. WAX confirmed this evidence by saying that "in the practice there is nothing to affect sewage injuriously."

R. FRANKLAND, Esq., F.R.S., a chemist of great repute, said that he could not call to mind any manufacture which is carried on upon a sufficiently large scale to affect the sewage of a town, so as really to deteriorate it to any perceptible extent.

Mr. J. KING thought the sewage of Birmingham would be more valuable were the gas water kept out of it. The ingredients through which the gas is filtered he considered destructive both to animal and vegetable life. Any water which passes through one of these—phosphate of copper—and spreads over the land must contain injurious qualities. "The gas tar," he said, "wherever it goes, has no affinity to take up other substances and to change; but it swims like a scum, and wherever the water has been with this substance in it, it adheres to the blades of grass like paint, and that adhesiveness has made it destructive to everything which it has touched."

Mr. THOMAS STANBRIDGE, Town Clerk, said, "Slyly and secretly, and at convenient times, a great deal of noxious matter is poured out from the gas works at Birmingham into the river Lea, which finds its way into the Tame, just beyond where these works stand." The discharge is injurious, and it

is also illegal; the penalty is heavy. This stuff is voided at flood times, and during the night. Mixed with the sewage it does great injury to vegetation. The gas companies would rather pay the penalty than be made to bottle the refuse. He stated that an action was pending against the Corporation of Birmingham for the destruction of fish in the river Trent, an injury which was laid to the sewage; but which he felt sure was due to the gas tar contained in the sewage. He also mentioned a "pickle waste," consisting of sulphuric, nitric, and muriatic acids exhausted by dipping metals into them for the purpose of ornamenting them by superposing a bright surface previous to their being lacquered; but though bad in its effect, he did not suppose so small a quantity would be perceived in so large a body of water as that into which it fell. With respect to the refuse of gas works, he also said he did not consider tar prejudicial; but one of the refiners used, namely, protoxide of iron, mingled with soil. This has been destructive to some land belonging to the Earl of Bradford at Water-Orton, adjacent to the banks of the river, about 8 miles from Birmingham. One of the best meadows of that hamlet, and a very large one, he described as "absolutely destroyed root and branch, and now reduced to a mere desert." This damage was done three years ago by the application of some soil which was drawn from the gas works. The farmers in the neighbourhood thought that this protoxide would have the same fertilising effect as other refuse they were accustomed to fetch from the gas works, but soon found their mistake. He considered that it would be in vain for Parliament to attempt to deal with sewage, or purify rivers until the voiding of such poisonous stuff as this was stopped. "The Inspector of Nuisances at Birmingham has frequently been to me with complaints of persons in the vicinity of gas works, of the effluvia escaping up the drains and sink holes, and other communications with their premises, while they were fastened up at night, and of their awaking half-afocused on account of this stuff which was running in the sewers."

Mr. WM. EVANS, Solicitor to the Birmingham and Staffordshire Gaslight Company, stated that it was quite a mistake that the protoxide of iron was treated as refuse; the gentleman under whose patent it was used contracted for it, and sold it to the sulphur manufacturers. The only other things which were objectionable, and used to find their way into the sewers, were ammoniacal liquor, sold to makers of sal ammoniac, and tar distilled for its cresosote.

Sir JOSEPH PAXTON, M.P., said that he knew not what might be the effect of the impurities in the manufacturing towns, but he believed that two systems of sewage would soon be introduced into all towns, one for the wash of towns, another for the water-closets. It must come to this; for although sewage manure is of considerable value, yet when it is diluted with 40 gallons of water to an individual per day, its force is too much weakened.

Mr. EDWIN O. TREGELLIS considered that the sewage of a town where large quantities of sulphuric acid were voided as refuse would be much increased in value.

SIXTH SECTION.—*Would the application of Town Sewage to Land or to Crops be likely to cause a nuisance, or be attended with dangerous consequences?*

Lord ESSEX said that there was a momentary unpleasantness attending the application of sewage, when squirted over the land. "If you go to leeward of it, you can experience an offensive smell; but that may be obviated in a great measure by holding the distributor near the ground." Five minutes after the absorption of the liquid, not the slightest smell is observable. The men employed in distributing the sewage, although often engaged 10 hours a day, have never complained of any ill effects arising therefrom. His lordship had no idea that a large quantity of it thrown upon land would injure the sanitary state of the river into which it would ultimately flow.

Dr. R. A. SMITH, F.R.S., who has studied the question of the utilisation of town sewage for several years, said that evaporation from sewage, conveyed in open gutters, would be dangerous to health. To get rid of this nuisance appears to him the great difficulty. "It seems to me the most important question to consider, and for that reason I have put every other question aside. I have given my reason for believing that there is a constant evaporation from the surface not only of water, but of impure matter, even should no water arise. I

have also given an account of what those gases are which do arise, and I have also shown that they rise instantly, and with great rapidity, and that, if the sewage matter be thrown upon the ground, the gases must continue to rise. The soil absorbs impure matter with great rapidity; but when land is sewage, a great amount is left upon the grass blades, and on this organic matter the action is very brisk. Sewage water should be used immediately; it will not preserve long." He thus spoke of recent experiments: "In order to trace the putrefaction of organic matter, I took blood as being a liquid of which we know pretty well the chemical composition, and as containing albumen, which may be said to be a type of those putrescible organic substances which can be found in the soil or in manure. I have found that, whenever the temperature arose to about 54 deg., the oxidation was intensely rapid: and there was more than oxidation—there was an evolution of carbonic acid gas, from the destruction of the substances in solution in the blood itself. These gases came out with immense rapidity. The most abundant was carbonic acid, which rose from 82 per cent. to 95; sulphuretted hydrogen was 1.93 per cent.; the remaining 3 per cent. consisted of carbonic oxide, carburetted hydrogen, hydrogen, and nitrogen. These are the gases given off from all sewage water, and come into our houses from the sewers, and which are given out from the land also, when land is in a state of too great moisture and heat. I conceive it to be an important thing to prevent the destruction of this organic matter, for two reasons—first, for the sake of health; and next, for the sake of preventing its loss." With respect to the pollution of drinking water, Dr. Smith affirmed that water, which contained ammonia in the proportion of only 2 grains to 100 gallons, had produced epidemic in the people who drank it; but that sewage water contained from 50 to 700 grains in every 100 gallons. Water which has passed through the soil to deep drains he considered not likely to contain more than a grain a gallon of mere organic matter analogous to peat. He considered that sewage might be immediately disinfected when applied to fallow land, but not in the case of grass land. He believed the presence of an unpleasant smell a proof of the presence of danger, and that absence of it is not a proof of the absence of danger.

Mr. J. B. LAWES stated that, although the smell in hot weather is strong, it is not perceptible more than a quarter of a mile off. At Rugby no deodoriser is used; but if sewage is employed within a moderate radius of London, it would be well to use some cheap, harmless substance, such as lime. He maintained the opinion expressed in the report of the Commission, of which he was a member, namely, "that the absorption of the offensive gases of sewage by the soil and by vegetation is so rapid, that there is no perceptible smell five minutes after the application; and it is therefore plain that, if closed drains or pipes were substituted for open ditches, the inhabitants of Edinburgh would cease to have cause to complain of this employment of the sewage."

Dr. A. W. HOFFMANN appeared to think slightly of the nuisance produced by sewage; and were it applied at proper times, upon proper soils, he considered that no harm would necessarily result. He observed that in the course of 6 or 10 hours the composition of sewage is changed, and that in the course of 6 or 10 days decomposition is accomplished; that the process is most perceptible in a tank, and of course less so when the sewage is allowed to pass over the surface of a field, on account of the great area presented.

Professor J. T. WAY gave utterance to an opinion most unfavourable to the practice of discharging sewers into rivers. With regard to the absorptive power of soil, he said he found there resided in soils an ability "to separate from liquids containing manure, ammonia, potash, phosphoric acid, and magnesia—all the important elements of manure; to separate them from water, not merely by infiltration, because these things would pass through a filter, but by the peculiar chemical attraction possessed by the ingredients of a fertile soil for these liquids; so that if we were passing a liquid, containing manurial matters, through a given quantity of soil, the water would pass through, and these matters would be retained—fixed in the soil." This he regarded as a designed provision for the preservation of manuring principles from being washed out of the soil by rains. Sewage is deodorized the moment it sinks into the soil. On grass land a certain portion remains upon the plant, and this might cause some smell. The water of sewage is perfectly clear as it runs off the surface of a field,

having gravitated from a higher to a lower level, or as it percolates through to the drains. This is the case at Croydon, where the water, after flowing over 300 acres of land, passes off in a beautifully clear state to the river, and at Edinburgh. He considered a large reservoir of sewage liable to very great objections.

E. FRANKLAND, Esq., F.R.S., a gentleman employed by the Board of Works to inquire into the deodorisation of sewage, said that, "in the application of very concentrated and nauseous sewage to land, I have found that the odour disappears almost immediately after the application; whilst the liquid flowing from the London sewers, even in very hot weather, is really not very disagreeable." In ordinary seasons he considered deodorisation quite needless, and when properly used, apprehended no disagreeable or hurtful effects from the use of sewage.

Mr. Alderman MACHI, who described his land as being perfectly drained, said that ordinarily no ill effects occur from passing the drainage water to the brook; but when "a strong dose of sewage had been administered, the water has come through the land highly coloured, and smelling." He considered very large applications of sewage likely to become a public nuisance. Eight hundred tons per acre could not be used without endangering the health of the population. Two thousand tons of London sewage might be applied, for by the new London lines of sewage there will be no stagnation, and the liquid will reach its destination almost before change has begun to set in.

Dr. AUGUSTUS VOELCKER stated that the power of the soil to arrest the manurial properties of sewage has its limits. "I find," said he, "that when the solution is made weak, even a clay soil will not remove from it the same quantity of ammonia, or of other fertilising matter, such as potash, as will be removed from a more concentrated solution." Very strong and very weak solutions both carry away with them a large part of their ingredients, and the water from a solution of medium strength passes away in a state of the greatest purity. He said that sewage was deodorized the instant it came into contact with the soil, but explained deodorisation to mean the parting only with some of the fertilising properties inconvenient to the senses, not necessarily with all. The ordinary sewage he considered to be so diluted, that it scarcely parted with any of its fertilising properties, and produced little more effect than the same amount of pure water running over the soil.

Mr. W. S. TILL, Borough Surveyor of Birmingham, stated that the sewage water, after having been used in irrigation, passes into the river. It is of a light brown colour, not offensive to the nose, and contains distinct traces of ammonia.

Mr. J. T. BLACKBURN, a farmer, said that, compared with dressings of solid manure, the advantage, in point of nuisance, was quite in favour of sewage. There was no need for deodorisation, if the land was well drained. The system of deodorisation pursued at Carlisle he thought quite unnecessary, because the sewage arrived at the outfalls before decomposition had commenced, and was used in a perfectly fresh state, without smell.

Mr. J. FENTON, Engineer to the Croydon Board of Health, had testified to the clearness and purity of the sewage water when it had passed over the 240 acres. It had the taste of ordinary rain water. At the time when the sewage was passed over 15 acres only, the Board was liable to injunctions; but now the water is so completely purified, that the river water sustains no damage, and there could be no ground, as formerly, for injunctions. The neighbourhood, in fact, now complains of no nuisance. He gave his opinion in favour of a close sewer, in preference to an open drain, to carry sewage upon the land, as less liable to produce a nuisance. When on the land, he preferred open drains to pipes, for with the latter a great "head," and a powerful engine to drive the stuff through, or a fall from a great height, would be absolutely requisite, and very costly to maintain. In the summer months there is a smell at the filter works, but by the use of carbolic of lime it is easily overcome. Since 1859 there has been no complaint, and yet there are houses within a quarter of a mile from the works.

Mr. GEORGE KING stated that the sewage from the lunatic asylum at Hayward's Heath, where 600 patients are confined, after passing over 17 acres of land, falls quite purified into a brook. Formerly it spoiled the water of the brook into which it fell, and it was necessary to carry it by a pipe drain to

some distance beyond the village; but since it has passed over the land, it has been rendered quite harmless.

Mr. JOSEPH PAXTON, M.P., did not think deodorization by any means always necessary, but he thought it generally advisable to disarm prejudice. The highly concentrated sewage used at Sydenham gives rise to little or no smell. This contains only one-tenth the water which is in the London sewage; and yet concentrated as it was, Sir Joseph found it practically pure after having passed through six feet of soil. A little water was always applied afterwards to wash it into the soil. The large tanks excavated at the Crystal Palace for the reception of sewage, being thoroughly ventilated, are not known to exist by the visitors, although the opponents of his plan prophesied the greatest trouble and annoyance from their being placed under the main entrance of the building.

Mr. G. H. HENDERSON said that the application of sewage at Colney Hatch produced no disagreeable effects, and was not complained of by the medical authorities. The sewage which escapes is deodorised; that which is used for irrigation is deodorised in its passage through the soil, and rendered perfectly pure.

R. C. MILLER, Esq., said, in reference to the Craigintinny meadows, that the ammonia, the offensive ingredient of sewage, was immediately absorbed by roots of the grass, and ceased to smell. Any person might walk over the meadow up to their ankles in water, and would not perceive that they were stepping in impure water. He stated that residing as he did a great part of the year on the west side of these meadows, and within a hundred yards of them, he experienced no nuisance, a circumstance due to the extreme dilution of the sewage. The Farnhill Barracks, which are *vis-à-vis* with his house, have been reported the healthiest in Scotland. "We have about six families partly engaged in irrigation, and some who have no other motives in living there than their own fancy, being perfectly unconnected with irrigation, living in an old standing in the centre of the meadows; and I think that we have some families with as fine children and healthy people as are to be found in the whole kingdom."

Mr. JAMES HOPE said that those who used the path between Edinburgh and Leith, which runs across the Craigintinny meadow, complain a little sometimes of smell. The people in the neighbourhood have made no complaint.

Mr. JOHN CHALMERS MORTON visited the Craigintinny meadows on a fine, windy, cool day, and found a "decidedly disagreeable smell." He had heard of no insalubrious effect arising from it to people in the neighbourhood. On the fields of Carlisle no smell was found from the deodorised sewage, excepting that which arose from decaying vegetable matter. Town-sewage he considered could not be applied without proving a nuisance, and should only be used where population is scanty. Should the application of sewage be reduced to the point when it was no longer a nuisance, the produce would be much diminished also. As to the relative absorption of soils, he thought those fertilizing ingredients which are of a volatile character were absorbed in proportion to the quantity of clay which they contain; "but then, in proportion to the quantity of clay which they contain in their composition, their mechanical power of dealing with water diminishes."

Mr. J. BENSON said that houses were within a quarter of a mile from the Duke of Bedford's meadows at Tavistock, and that the smell on a foggy day would be no worse than what would arise from land newly manured with solid dung. It is offensive, but not, he thought, deleterious. People have actually been building nearer the nuisance, which is not complained of. No fevers, &c., appear to have attacked the quarter of the town where these meadows lie.

Mr. GEORGE McCANN said no smell arose from his sewage irrigated meadows, and no injurious effects to the tenants of numerous cottages within 30 or 40 yards of them. The water which runs away is much discoloured, and that which drains from the Malvern Link into a small stream which runs past Lord Braceham's estate is considered very offensive.

P. W. E. MILNE, Esq., said that when the sewage is used on the lowest field, a quarter of a mile from his house, even when the wind is in the direction of the house, no smell is perceptible. Nearer it is not pleasant, unless the wind blows from another quarter.

Mr. W. WESTWOOD stated that before the sewage of Croydon was run over a large area of land, at the time when a great part of it was run into the brook, great complaints were

made. A deposit of filth was left along the brook for a mile or two through the country. The people in the neighbourhood made no complaints.

Mr. F. WILBY employs sewage four hundred yards from his residence without bad effects; still, on sanitary grounds, he thought the application of sewage should be as far removed as possible from human dwellings. When the supply of water per person is small, the sewage is apt to stagnate in the sewers, and it will then give out a very offensive and dangerous odour; but when plenty of water is used, this is not the case, for the sewage passes quickly to the field, and is utilized before decomposition takes place. The drainage and use of sewage at Coventry is now, he said, "quite satisfactory in a sanitary point of view." He also stated that Mr. Austin had been down to deodorise it, but that they were perfectly satisfied that the expense of using pernitrate of iron would be too great, and lime was, as proved at Leicester, destructive of the manure.

The SEVENTH Section of this analysis embraces the evidence given in answer to the following question:

Can solid manure be profitably manufactured from town sewage?

J. B. LAWES, Esq., stated it as his decided opinion that in a commercial point of view the manufacture of sewage or sewage residuum into solid manure would be unsuccessful. "The most valuable part of sewage remains in the liquid, and cannot be extracted."

Professor J. T. WAY was also of opinion that a dry manure cannot be profitably obtained from sewage—not by means either of precipitation or evaporation. Some such process might be pursued with advantage as a means of getting rid of the nuisance from a town, provided that the town pays the expense. For sanitary purposes considerable good might be gained by precipitation; but pecuniarily, nothing—for agricultural purposes the result would not pay for the expense.

Dr. EDWARD FRANKLAND agreed with Mr. Way's opinion.

Mr. Alderman MARCHI said that no hope existed in the minds of scientific men at present of abstracting and reducing to a solid matter the valuable ingredients of sewage.

Dr. AUGUSTUS VOELCKER spoke of all the schemes put forth to reduce sewage to solid manure as failures. He entertained no hope of ever producing a solid manure that will pay the expense of conversion. F.R.S.

TO KILL LICE ON YOUNG CHICKENS OR TURKEYS.—Take of any oil that one happens to have on hand three parts and one part kerosene oil—shake well together; apply as follows: Take the young chickens or turkeys when about 24 to 48 hours old—just at night is the best time; hold the chicken in one hand, while the oil is applied with a finger of the other hand to the head of the chicken, being careful not to get the oil into the eye, although it would do no farther harm than to make the chicken feel a little uncomfortable for a few minutes. The application at the above-mentioned age, and again, if needed, at about one month old, will prevent lice troubling the chickens. To tell whether a chicken is lousy, observe whether it is more fond, than usual, of being brooded by the hen, whether its wings droop or seem to grow faster than its body. These are sure signs that lice are eating away the life of the chicken, and it will die in a few days unless attended to at once. Should the nests where hens incubate become infected with lice, take kerosene oil and an old brush, or a bit of cloth, and apply the oil freely to the wood-work of the nests. There will be no lice alive about those nests again for weeks. If hens get very lousy, kerosene oil reduced one-half may be applied to the head, neck, and rump of the fowl; two applications one week apart will kill all; but if fine loam three parts and ashes one part are kept where the hens can wallow in it, they will not be troubled again with lice, although the hen-house should not be renovated with whitewash oftener than once a year. The free use of kerosene oil in a henery will prevent all trouble from lice, as they will not stay where its pungent odour is.—BROOKS, in *Albany Country Gentleman*.

AGRICULTURAL SHOW AT SELBY.

The tenth annual show in connection with the Selby, Tadcaster, and Market Weighton District Agricultural Association took place at Selby on Friday, July 8. The attendance of visitors was very numerous. The show was the best that has taken place since the establishment of the society, the exhibition of horses and agricultural implements being particularly large. The judges were:—Cattle, sheep, and pigs—T. C. Johnson, Cheret, Wakefield; J. T. Robinson, Lockby Palace, Northallerton; George Walsley, Reedstone, Bridlington. Horses—Jackson Everitt, Park-lane, Doncaster; William Lancaster, Morton-upon-Swale, Northallerton; Thomas Stamper, Highfield House, Oswaldkirk.

PRIZE LIST.

LORD LONDESBOROUGH'S SPECIAL PRIZES.

BULLS.—Best pure shorthorn bull, under three years old, to be used in the district of the association for twelve months, J. R. Middleborough, South Milford, silver cup, value £10.

HORSES.—Best four or five years old hunting mare or gelding, Jas. Hall, silver cup, value £10; 2nd do.; highly commended, Wm. Smith, Toulston; commended, Robert Smith, Brayton, and Robert Danby.

REV. RICHARD BROOKE'S SPECIAL PRIZE.

HORSES.—Best four years old hunting gelding, £5, Robert Smith, Brayton.

GENERAL PRIZES.

CATTLE.—Shorthorned: Best bull of any age, Henry Smith, Drax Abbey; 2nd, Charles Boast, South Duffield. Best cow of any age, in calf or milk, J. R. Middleborough, South Milford; 2nd, Henry Morley, Melbourne. Best bull under two years old, Robert Gell, Grimston; 2nd, J. R. Middleborough, South Milford. Best two-year-old heifer for breeding, J. R. Middleborough; 2nd, Henry Smith, Drax Abbey. Best yearling heifer, J. R. Middleborough, South Milford; 2nd, Richard Brooke, Gateforth House. Best cow for dairy purposes, Thomas Simpson, Selby Common; 2nd, Wm. Blythe, Selby. Extra stock; In-milk, red and white cow, J. R. Middleborough, South Milford.

SHEEP.—Long-wooled sheep: Best shearling ram, E. Riley, Kiplin Cotes; 2nd, J. Simpson, Spofforth Park. Best aged ram, W. Angas, near Driffield; 2nd, Joseph Simpson, Spofforth Park. Best pen of five breeding ewes, J. Simpson, Spofforth Park; 2nd, R. H. Thorpe, Temple Hirst. Best pen of five shearling gimmers, Geo. Lane Fox, Bramham Park; 2nd, Wm. Angas, near Driffield; commended, J. Simpson, Spofforth Park. Best pen of five shearling wethers, Geo. Lane Fox, Bramham Park; 2nd, Robert Smith, Brayton. Best pen of five sheep of any breed or cross not eligible in any preceding class, Right Hon. Lord Londesborough, Grimston Park. Extra stock: Five rams, three months old, Riley Briggs, Osgodby Hall.

Pigs.—Best boar, large breed, John Dyson, Leeds; 2nd, William Brown, Spalding Moor. Best sow, large breed, in pig or milk, John Dyson; 2nd, Miles Hutchinson, Newsham Park. Second best boar, small breed, Lieut.-Col. Markham. Second best sow, in pig or milk, William Hindle, Barby. Best three store pigs, not more than twelve months old, James M. Backhouse, Wistow; 2nd, James Burton, Selby. Best cottager's store pig, for cottager not paying more than £6 yearly rent, and not occupying more than one acre of land, Charles Limbert, Milford Junction; 2nd, Thomas Marwood.

HORSES.—Best thoroughbred stallion for hunters, T. H. Outhwaite. Best stallion for coaching purposes, Executrix of P. Ramsdale, Goodmanham; 2nd, Robert Gill, Kelfield; commended, George Sanderson, Spalding. Best stallion for roadsters, H. R. W. Hart, Dunnington Lodge; 2nd, Executrix of P. Ramsdale. Best hunting brood mare and foal, Joseph Richardson, Selby; 2nd, Joseph Harker, Cliffe. Best coaching brood mare and foal, John Poulter, Naburn; 2nd, W. Brockton, Tadworth Green. Best roadster brood mare, and foal, John Long, Skipwith; 2nd, Francis Cook, Thixendale. Best brood mare for agricultural purposes and foal, Samuel Thompson, Skipwith; 2nd, Samuel Strickland, Headley Hall. Best three years old hunting gelding or filly, John Stephenson, near Tadcaster; 2nd, John Richardson, Selby. Best two years old hunting gelding or filly, Robert Calam, Welham Bridge; 2nd, Lord Londesborough. Best three

years old coaching gelding or filly, Richard Robson; 2nd, John Appleyard, Wistow. Best two years old coaching gelding or filly, James Forster, Wistow; 2nd, Miles Hutchinson, Newsham. Best three years old roadster gelding or filly, W. K. Goodbarne, Ouston; 2nd, W. Warrington, Ca-wood. Best two years old roadster gelding or filly, S and J. Midgley, Coveringham; 2nd, John Fern, Selby Common. Best roadster, nag, or mare, of any age, Robert Scholfield, Sand Hall; 2nd, Peter Kirby, North Duffield; commended, Captain Egerson, Londesborough; Robert Scholfield, Sand Hall; William Brock, Tadworth Green; J. Clarkson, Warter. Best pony, not exceeding 14 hands, of any age, John Long, Skipwith; 2nd, William Stephenson, Busby Hill; highly commended, George Turner, Walton; commended, W. E. Hind, Howden; John Cundall, Acaster Malbis; Charles Shann, Tadcaster. Best pair of horses of either sex, for agricultural purposes, worked during the season, Wm. and Robt. Jewitt, Hemingborough; 2nd, John Richardson, Barby. Best three years old agricultural gelding or filly, William Swinbank, Riccall; 2nd, W. and R. Jewitt. Best two years old agricultural gelding or filly, W. and R. Jewitt; 2nd, Edward Appleyard, sen., Wistow. Best yearling gelding or filly for agricultural purposes, W. and R. Jewitt; 2nd, T. Dickinson, Hopperton. Extra Stock: Coaching colt, Edward Appleyard, Wistow.

REVIEW.

THE LAW OF RAILWAYS, RAILWAY COMPANIES, AND RAILWAY INVESTMENTS; by SIR WILLIAM HODGE, Knt. THIRD EDITION; by CHARLES MANLEY SMITH, Esq., Barrister. *Sweet, Chancery-lane, London. 1868.*

Almost all persons now-a-days are interested in railways, which have penetrated the whole length and breadth of the land, and, with the aid of Parliament, are still pursuing their irresistible course. Country gentlemen and farmers whose lands are invaded by railways, and magistrates who are frequently called upon to exercise their functions in reference to small claims for compensation and other matters arising out of the proceedings of railway companies, are especially interested in the law applicable to such subjects. No apology, therefore, is needed for calling the attention of our numerous readers to the new edition of Sir W. Hodge's valuable work on the "Law of Railways," just published by Mr. Manley Smith, which is, we believe, the most complete and comprehensive work on this complicated and difficult subject yet offered to the public. In it will be found not merely all the law applicable to railway shares and investments, compensation for lands taken for, or injuriously affected by, the works of the company; the jurisdiction and powers of the Board of Trade over railways; and the various obligations and restrictions imposed by the Statute Law upon railways: but also as to the rights and liabilities of railway companies considered as carriers of goods and passengers, including, of course, the liability of railway companies to pay compensation to persons injured by railway accidents. There is also added a long chapter on the subject of the assessment of railways to the poor-rate, a most difficult subject, and one which must shortly occupy the attention of Parliament, who ought to endeavour to lay down rules on this matter which might relieve the judges from some of the difficulties which at present exist in applying the Parochial Assessment Act to railways.

Having said thus much by way of calling the attention of our readers to this work, we will only add that we think the public are much indebted to Mr. Manley Smith for the able and careful manner in which he has prepared this edition for the press.

THE CENTRAL FARMERS' CLUB.—The anniversary dinner of the Club took place at the Ship, Greenwich, on Monday, July 6, when, as usual, but a small party could be got together at so busy a season. Mr. G. P. Tuxford, however, who was in the Chair, spoke to the good position of the Club, alike as regarded its funds and its influence, while he expressed himself as equally sanguine as to its future prospects.

WHEAT CULTIVATION IN PRUSSIA.

Considering that Prussia is now the second great source of our foreign supply of wheat, it may be interesting to look into the details of wheat culture and export of that country. After the United States, Prussia now stands before Russia in the amount of wheat sent to the United Kingdom. The figures last year were in round numbers 3,769,000 qrs. received from the United States, 1,457,000 from Prussia, and 1,333,000 from Russia; Canada and Egypt standing next in amount, the former for 871,000 qrs. and the latter for 800,000.

The agriculture of a country which supplies us with one-sixth of our foreign bread-corn is necessarily a subject of interest to the farmers of this country. In 1840 Prussia sent us 807,000 qrs., in 1850 883,000 qrs., and in 1860 1,155,000 qrs.; whilst last year, as stated above, there was an advance on these figures of 800,000 qrs.

Taking quinquennial periods, the exports of wheat to England have averaged as follows. In the years ending—

1835	113,000	quarters.
1840	526,000	"
1845	652,000	"
1850	567,000	"
1855	702,000	"
1860	723,000	"

The years 1853, 1860, and 1862 were those of the largest export. Prussia thus receives from us £2,500,000 to £3,000,000 for wheat alone.

The average decennial prices of wheat (per bushel) in Prussia, compared with England and France, have been as follows in silver groechens (30gr. = 8s. English):—

Years.	Prussia.	England.	France.
1830	57.00	111.70	80.87
1840	58.08	107.95	83.48
1850	70.43	100.73	86.81
1860	88.75	105.46	98.16

Prussia imports from one-and-a-half to two million bushels of wheat yearly from Russia and Poland.

There are no official data of the quantity of wheat produced annually in Prussia, but an approximate estimate may be obtained from some returns available. M. Dietrich took much pains, some years ago, to investigate the matter. In Prussia, the governors of provinces have at all times made reports on the state of their districts, which descend into minute details. From these it was possible to ascertain the quantity of land under tillage, the variety of the crops, and the results of the harvests. But there were also means of reducing those calculations to greater exactness. Mills in former times were always an object of control. In Prussia, a formal tax has long been, and is still, to a great extent, levied on corn ground. In 1859 there were about 32,000 corn-mills in Prussia, 15,000 worked by water, 14,500 by wind, and 1,900 by horses, and 500 or 600 by steam power.

Tabular statements have been drawn up, from the local registers, which are very authentic records, and these assist (the difference of means and of habits affecting town and country residents being allowed for) in forming an estimate of the total consumption.

It appears that six scheffels, or a little more than one quarter, of mixed wheat and rye, was the estimated consumption for every adult, some twenty years ago, by the miller's experience.

The meal tax levied on the towns shows a consumption, for all ages, of about four scheffels of 80lbs. per head. In

1841 the aggregate consumption of grain, rye, and wheat was estimated at 52,000,000 scheffels (six being a little more than a quarter), and the export was about 5,400,000 scheffels more.

According to an official statement, there were at the end of 1858, in Prussia, 2,121,385 estates or farms, with an area of 93,126,300 Prussian acres, and 11,990 manors, with an area of 24,950,654 Prussian acres.

Agricultural pursuits are followed for a livelihood: First as a principal business by proprietors, farmers, their families, and labourers, to the number of 5,878,437 persons; second, as a subordinate occupation by farmers, their families, and labourers, to the number of 2,177,822, in all 8,055,759 persons, or close upon half the entire population.

There are data to warrant the conclusion that the arable land in Prussia produced in 1805, 44,000,000 scheffels of food grain; in 1831, 53,000,000; and in 1841, 68,000,000.

Mr. Judd, the United States Minister at Berlin, in a recent communication to the Agricultural Bureau at Washington, states that the average produce of a harvest in Prussia is estimated (though still very vaguely) at about 20,000,000 bushels of wheat, 66,000,000 bushels of rye, 55,000,000 bushels of oats, and 150,000,000 bushels of potatoes.

The seed time in Germany is from the beginning of September to the end of October. One to one and a-half bushels are sown broadcast to the acre. The grain is harrowed under equally, or by a sowing machine covered with soil one or two inches deep. With drill cultivation 50 per cent. less of seed will suffice. Drills sow it in furrows usually nine inches broad, which, when the plants come up in the fall and spring, are by soft instruments covered loosely with soil. The weight of the Prussian bushel (or scheffel) of wheat ranges from 82 to 96 pounds, or the average about 86 pounds. The best kinds of German wheat are the Frankenstein (Silesia) and the Cujawej. The colour is almost white; but when planted in another region the colour becomes darker, and the yield of grain is diminished. A well-manured and cultivated soil yields to the Prussian acre (150 square perches) 85 cwt., of which 10 to 12 are grain, and 25 to 28 straw. In good harvests 100lbs. of sheaf yield usually 80lbs. of grain and 70 of straw—at poorer harvests 40lbs. of grain to 60 of straw. On very grassy soil, which usually yield more straw, but less grain, the proportion between the latter and the former is often as 25 to 75.

As in France and England, wheat is now the chief article of food consumption, but hardly yet in the same large amount. In the towns and some of the provinces the consumption of wheat reaches 132½lbs. of wheat per head annually. But the average can scarcely yet be set for the whole population above 105lbs.—an increase, however, in the use of wheat of fully 50 per cent. in the last 20 years. Potatoes have come much into use in this interval, but have led to no diminished consumption of wheat flour. The quantity of potatoes consumed in Prussia reaches 1,248 lbs. per head. In France the relative proportions are, wheat 232lbs., and potatoes 270lbs. The equivalent of nutriment in wheat is about 31½ per cent., in rye 30 per cent., and of potatoes 7½ per cent. The average price of wheat in Prussia was 58 silver-groechen the bushel in 1850, 119 in 1855, and 88 in 1860 and 1861.

By attentive cultivation, and the influence of climate

and soil, more than two hundred varieties of wheat have been produced from the original species. They are divided, according to the colour of the grain, chiefly into white and coloured, and, according to the formation of the ears, into eared and bearded wheat. There is another discrimination between common wheat (*Triticum vulgare*) and cone wheat (*T. turgidum*); the former has oval-shaped grains, with ears smooth and four-sided, and furnished with spars starting out irregularly on all sides; the latter has seeds of a rounder shape, and the ears contain invariably beards running parallel in four straight rows. Common wheat yields more and better flour than cone wheat. Each variety is variable; it is changed by the climate and the influence of cultivation.

Finally, we may glance at the condition of the land in cultivation. And here we find a law in operation which checks the tendency to the dispersion of property and the breaking up of farms below the extent at which cultivation is profitable. This is a law of custom, not of enactment. It consists in that usage, traditional not only in the Prussian provinces, but over a large part of Germany and Flanders, by which the peasant proprietor, at the approach of old age, resigns the ownership as well as occupancy of his farm to one of his children. This child takes the estate and stock upon it at a moderate valuation, usually below its market price. Speaking generally, the Prussian

small proprietors are a frugal race, comfortably off, and in some districts even intelligent and well-informed. As a class they show no symptoms of disappearing before the encroachments of either cottiers on the one hand, or larger landowners on the other; they are, on the contrary, more flourishing and well to do than at any former period of Prussian history. Each province has, however, its own peculiar conditions; on the one hand we have Pomerania, where large properties are the rule, and the cottier is hardly known; at the other end of the scale stands the Rhine province, in some parts of which the parcelling of the surface has been carried to as great an extent as in France. Notwithstanding, when we take the whole area of the Rhine province, we find that only ten per cent. of the whole is in holdings of under 4 English acres, while 85 per cent. is in properties of from 20 to 300 acres, and 21 per cent. in estates of 400 acres and upwards. In Pomerania, where there are hardly any cottiers, no less than 62 per cent. of the total area of the province is in estates of 400 acres and upwards, properties of from 20 to 400 acres forming 83 per cent. of the area. In the provinces of Prussia, where cottier owners are also few, the area is more equally divided than in any other province; 88 per cent. of its area is in estates of upwards of 400 acres English, and 49 per cent. in properties varying from 20 to 300 acres.

ANNALS OF STEAM CULTURE.

Any one who will be at the trouble to consult an old map of England will perceive that a great change has taken place in the eastern boundary. The Wash once spread over a much larger territory; but the inhabitants of the region, who got the knack from the Roman conquerors, have gradually driven back the water, and made the North Sea the principal agent in its own exclusion. In the district called Marshland, in Norfolk, extending between the Ouse and the Nene; in that called South Holland, in Lincolnshire, stretching between the Nene and the Welland; northward of Spalding, and also north-east of Boston, there is a considerable tract of marine clay soil. Within the Roman bank by which the district was first defended from the ocean lies very fine grazing land; beyond it, and similarly defended by a series of banks raised to secure each successive enclosure, the majority of the land is arable. The extraordinary feature of this tract is, that the surface outside the Roman bank is three or four feet higher than that on the inside, and the level of each new enclosure is more elevated than the previous one. The land rises step by step as the coast is approached, so that the most recently reclaimed land is often twelve or even eighteen feet higher than the lowest fen land in the interior, the drainage from which must nevertheless be conveyed through these more elevated marshes to the sea.

The extent of this kind of land already rescued from the sea is very great, and is constantly augmenting. The whole Wash may, in fact, be regarded as a broad expanse of marsh in course of formation. A considerable portion of it is already so much raised as to be left bare at low water. The "Norfolk Estuary Scheme" now in progress contemplates the enclosure of a large tract of these sands, and the "Victoria Level," if ever executed, "will confine the waters to a channel four miles wide, running down the centre of the Wash, and add 150,000 acres to our territory. This would not be all, for if these works are accomplished they will lower the water in all the fen rivers, and afford a natural drainage to the whole of the great level."

Well, on these marsh lands I find there are several steam cultivators at work; all, I believe, for reasons to be afterwards mentioned, of Smith's or the Howards' manufacture. I have only now to do with two, one of Smith's and one of Howards', which I found hard at work, and highly appreciated by their owners, in that portion of the Norfolk marsh district known as Marshland, lying four miles to the west of King's Lynn. They are possessed by Mr. James Walker and his son Mr. William Walker, both of Terrington, a village known to those who frequent the Lynn and Spalding road by its splendid church.

Mr. Walker, once an extensive railway contractor, and still engaged upon several engineering works in the neighbourhood of Lynn, returned to his native village some years since, and purchased of a member of the Bentinck family a considerable portion of the 1,600 acres over which he sways the undisputed sceptre of possession. The original purchase, I believe, was 800 acres; but this was augmented by an enclosure five years since to the present dimensions, or, rather, by two enclosures, the date of the first being 1858, of the second 1859. The total cost of enclosing this area, of throwing around it a high sea bank, &c., was £20,000. This bank, reported to have been broken by the high tides three months since, has never suffered the waves to disturb its integrity.

Mr. Walker, sen., retains 1,000 acres of this land under his own hand, and employs Smith's apparatus as manufactured at Bedford in 1856. Part of his land is old, and part new marsh. It is on the new marsh where steam is most employed. His son occupies 350 acres of the new enclosure, and employs Howards' apparatus with increasing satisfaction. The remainder is let.

Of the 350 acres occupied by Mr. William Walker, the 300 acres of arable land have been under steam culture two and a-half years. A one-horse-power engine arrived in May, 1861, with the drop windlass and the new cultivator. The latter implement, however, is not much used, for several scarifiers of greater size have been substituted to suit various operations. Sets of harrows, too, have been

constructed, and work well; and clod-crushers and land-rollers are drawn over the land backwards and forwards without attendants, and without difficulty. I happened to see a field which had been ploughed in the week, being treated with the clod-crusher, reduced to a simple cylinder and slung between two triangular frames, so as to form the base lines. No other process could have so speedily reduced the stubborn baked furrow-slices to a seed-bed for barley. The field lay in small lands, and the roll went bounding from furrow to ridge, from ridge to furrow, with a furious motion, which overcame all tenacity of purpose on the part of the soil, and reduced to dust indurated clods that would never have yielded to any horse-drawn crusher. This gentleman bethought him, some time since, of a right angled triangle in place of Mr. Smith's turn bow, and has ever since used it with great effect. The ropes are attached to the extremities of the two legs of the triangle, which works horizontally on a horizontal semicircle. The slack rope is thus carried out beyond the implement, out of harm's way, and ready at once to turn it at the land's end. There is also an improvement in the snatch-blocks: pulleys, four feet in diameter, have taken the place of the smaller ones at present issued by the manufacturers, and these are fixed to boards four feet by five, and never tip over. Each snatch-block has two anchors and chains, and the progressive movement along the headland is effected in the most easy way, if deftly worked, and without stopping the engine. The pulleys work on brass bushes. An improvement has also been made in the anchors—not in the curve of their claws, but in their form. The front part of the claw, which has to resist the strain forwards, is very broad and blunt, and the back is sharp, which facilitates its up-heaval. The harrow consists of a series of hungry-looking curved tines, fixed in a triangular frame supported on three small wheels to regulate depth, or carry it from field to field. The extreme width of this harrow is seven feet six inches, and, when required, a roll is attached in rear. Sometimes a roll is attached behind a cultivator, and a harrow behind the roll; or a harrow behind the cultivator with the roll in its rear. A carpenter and blacksmith are always at work on the estate, and Mr. Walker and his son being of a mechanical turn, a great many experiments are being tried. Some, as usual, turn out failures, and some successes. All, however, tend to reduce the labour of men and horses in the several operations of farm tillage, and, if continued, will, doubtless, bring our present machinery to greater perfection. The rope, which seems to be rather more than half-worn, has cultivated 2,000 acres since the summer of 1861—400 acres having been worked between February and April—and repairs have been but slight. The land, for the most part, is stiffish, three or four horses being required to turn a furrow six by nine. Without steam sixteen horses would be needed; twelve are now kept—a greater number than will soon be wanted.

There is no possibility of entering into any calculation to ascertain the advantage Mr. Walker, sen., has obtained from the employment of Mr. Smith's apparatus on the large tract of land under his own immediate management. In the first place, he has kept no account; and, in the second, he has not confined himself to the implements issued, but has deviated in all kinds of ways from the rule according to Woolston. He gave an order, for instance, to a Lynn engine builder of the name of Savage, for a great road locomotive of twelve-horse power, with two speeds, which is constructed to be driven safely with 150lbs. pressure. This engine is the slave of the farm, and does everything within the province of such a monster, from the crushing of corn and cutting of chaff to the hauling of implements through the land, the drawing of thrashing machines from farm to farm, and the pulling of the thrashed produce to the nearest market. The works are

sheltered by a corrugated iron roof and side curtains. The quickest speed is six miles an hour.

The power employed to keep the 1,000 acres in good condition is 30 horses, in addition to steam. In order to give readers some idea of what can be done with steam in the field, I give a few particulars of work since last harvest, commencing with August:

20 acres of pea-land deeply stirred twice and harrowed with harrow behind the scarifier; then ploughed with horses, and harrowed by steam, ready for the drill.

18 acres of oat stubble twice cultivated by steam, twice ploughed with horses, once harrowed by steam, and prepared for drill.

14 acres of bean stubble, twice cultivated by steam, twice harrowed by steam.

16 acres of wheat stubble cultivated by steam three times, each time with the harrow behind, and harrowed before and after the drill.

14 acres of wheat stubble (clover missed), three times cultivated and harrowed by steam, harrowed before and after drill, and sown with oats.

14 acres of sheep-fed turnip land, ploughed with horses, clod-crushed once, and harrowed six times by steam, finally drilled and harrowed.

9 acres of wheat stubble, very foul, ploughed twice, cultivated and harrowed twice by steam, and drilled with barley.

24 acres for roots, ploughed twice with horses, cultivated and harrowed twice by steam.

26 acres, missed wheat, harrowed six times, and drilled with barley.

The mode in which the land is prepared for roots is as follows: It is ploughed in the autumn, and in early spring ploughed back. In February it is deeply cultivated by steam, the rubbish is pulled up and kept on the surface till killed by the sun and winds of March. The seed may then be sown without more labour.

Hitherto the apparatus has been confined pretty much to 250 acres of the heaviest soil near the homestead; but when the latest enclosed land shall be a little more prepared for it, it will have a wider scope. An area just reclaimed from the sea presents by no means a level appearance to the eye. As the sea left it all cut up by main and intersecting creeks, so is it found by the husbandman, who is not always a very patient husbandman in his perplexity to know how to crop this uneven surface to the best advantage. Of course the first thing required is drainage. Ditches are cut 5 feet wide at top and 3 feet deep, dividing the tract into fields of 16 or 20 acres. These fields are then laid as dry as they can be by means of flag or sod drains, which are subsequently crossed by pipe drains, 1 chain apart and 3 feet deep, the boundary ditches being widened to 7 feet and correspondingly deepened. Drains are also cut along the largest creeks when they are filled. Then begins the work of levelling. Little one-horse ploughs are frequently used, to plough round the creeks. This is done year after year, the cultivator and harrows being freely used, until at last the mere traces of former channels alone remain, and the loamy clay which floats as it were upon the bed of "boiling silt" bears a beautiful and uniform crop. The water is conducted to large basins properly excavated, and nicely calculated to hold such a quantity of fresh water as will balance the upward pressure of the salt-water, and keep it from rising.

The process of levelling is very much aided by the steam-cultivator and harrow. The sharp and deep movement of those implements, without the tread of the horses, is just what is wanted, and I had an opportunity of contrasting two portions of a new enclosure, one of which,

worked by horses, produced only a miserable and patchy crop, in comparison with that worked by steam, whereon the crop was even and promising. The round-about system here is the only one that could be adopted. It is dangerous to adventure a heavy engine upon this quaking soil, as I had an opportunity of seeing; for suddenly when making a turn to show its powers, one wheel of the heavy locomotive dropped into a drain: in less than five minutes the boiler was resting on the ground, and all hands were engaged with jacks and levers for six hours before it could be extricated. Besides, the fields are not large, and at

first the course of the implement is not straight, but must follow the sinuous tracks of the water-courses.

As respects the rope, 1,600 yards have been added since 1858. The working expenses per day are as follows: Labour, five men and one boy with water-cart, 15s.; coals, 10 cwt., 8s.; oil, 1s. Turning is effected in 12 seconds; a rope breakage costs 20 minutes. Mr. Walker does not consider that the length of rope out makes much difference in the expenditure of power. He is perfectly satisfied with the apparatus, and would not now attempt to farm without steam.

F. R. S.

ESSEX AGRICULTURAL ASSOCIATION.

MEETING AT WITHAM.

The establishment of an Essex Agricultural Society some half-a-dozen years since was regarded by many as rather a forlorn hope. Such a thing might do just for a mere spurt, and as following in the immediate wake of the Royal Meeting at Chelmsford; but in a non-breeding district like Essex, a stock show could not continue to prosper. It is satisfactory to say, that any such fears have been by no means realized, as the institution not only holds its ground, but is gradually extending its influence, so that the entry at Witham was the best the management has ever yet known. There were more horses, more cattle, and more sheep exhibited than on any previous occasion; while the pigs stood well, in numerical comparison with former years; and the array of implements was quite up to the average of other anniversaries. It must be remembered, moreover, that the Essex Association, unlike its neighbours in Norfolk and Suffolk, has to depend mainly upon its own resources; not however that these were employed to the utmost. Mr. Fisher Hobbs sent nothing but a cob mare, whereas a few of his famous black pigs, or Southdown sheep, and Alderney heifers might have done much to complete the character of these several sections; as Mr. Crisp might have materially strengthened the entries of short-horn cattle and Suffolk horses. The quality, in fact, of some of the classes was not of the highest, and well as Witham will rank for numbers, there is no question but that certain of the breeds peculiar to the eastern counties have been, ere now, better represented. The Suffolk horses for instance, with which the catalogue opens, brought together a very moderate class of all-aged stallions, two or three of the best of which were disqualified from unsoundness, the prevailing complaint being disease in the feet. It should be understood, however, that although the chestnuts greatly predominated, the agricultural horses were not required to be pure Punches; and Mr. Croxon's first prize horse, although himself of the orthodox colour, is, we believe, bred from a bay or a brown on the sire's side. He is an animal of great weight and substance, whereas the second is rather a light-bodied one; and far away the first of the "passable" cart-stallions was the All-England winner, Felsted Hero, a horse of a good dark wholesome colour, with a neat kindly head, a fine neck and forehead, and fair length and depth, to support the veterinary ordeal to which he was subjected. This is palpably the testing point with the Suffolks, and beyond what was done on the ground in the way of rejection, Mr. Spooner, one of the judges, while testifying at the dinner to the excellences of some of the stock, went on to hope that the owners of others would never think of breeding from the horses they had deemed to be good enough to exhibit. The best

two-year-old was a well-grown colt, by Mr. Wilson's own horse Goliah, and the second a smart compact son of Crettingham Hero, from whom Sir Thomas Lennard is breeding extensively. The mares and fillies were generally better than the horses, and five out of the eight cart-mares entered received either premiums or commendations. Mr. Clayden's first is a clever level mare, while Mr. Sewell's second is but a plain one to look on, and Canterbury Nun still as handsome as ever, if denied here her usual place on the prize list. Sir Thomas again could reach no higher than second-best with the fresh comely Blossom, Mr. Badham replacing Matchett with Brag as the best mare with a foal in the county. For the best of all, however, mares or horses, as demonstrated by the strength of the Witham Show, we should go to the three and two-year-old fillies, the first in either class being clearly the pick and pride of the horses for agricultural purposes. They were both bred by Mr. Ward, of Mersea; but Ruby is now the property of Mr. Walker, of Wennington, who won with her at Yarmouth last week, where we spoke to her as still improving on her last year's form. The Belhus filly Romford Lass was originally placed as next best here, but being subsequently put out from contracted feet, Mr. Speakman succeeded to the second honours. The Mersea two-year-old was also first as a yearling at Halstead last year, when we duly recorded her merit and promise, which she has amply fulfilled. With great bone and substance, she has a good head, fine symmetry, and altogether the air and makings of a grand mare. Mr. Badham's second, a daughter of Old Matchett, and by Chester Emperor, shows a deal of quality, as she is bound to do, and at the same time no lack of weight or power. Mr. Giles' yearling, of immense size and weight for his age, is also well connected, as own brother to the Battersea prize colt, though not so truly formed a horse, and his capital quarters only tell the more against his rather faulty forehead. Mr. Clayden, who was second here, won outright with his clever filly by Canterbury Pilgrim, opposed as he was by such good company as that of Mr. Ward, Mr. Badham, and Sir Thomas Lennard could supply. If the cart stallions were inferior, it is an encouraging sign to see that the mares and fillies were pretty generally so good, the case being but too commonly the other way; while it is due to something better than any sire in the show that this improvement is attributable. There is a style about the Young Emperors, Heroes, and Pilgrims, that must cross well with anything really worthy of them, and we cannot understand that good looks should tell against even the value of a draught horse; though some people will have it that the improved chestnuts are already "too pretty." We go the rather with the renowned Mr. Jorrocks for

something to please the eye, "whether it's maids of honour or maids of all work."

Professor Simonds was very busy again amongst the riding and coach horses, where he threw over the two best-looking of the hunting mares, and thus left the Judges nothing to go on with. The hack stallions were of much of a muchness with some of the Suffolk sires, but the Young Prickwillow has the recommendation of rare action, and is consequently a very different nag to stand alongside, with his plain head and neck, to what he warms up to when set agoing. The strength of this section, however, centred on the best thorough-bred stallion, the grand, handsome, stylish Sir John Barleycorn, still showing the irreparable signs of all his glorious doings over a county, but in other respects a very different horse to the neglected, seedy-looking animal they sent up to Battersea last summer; where, if in anything like form, it would have been impossible for so false-framed a horse as Ellington to have beaten him. Sir John had only one to meet now; but old Dr. Sangrado, in his three-and-twentieth summer, is still a wonderful one for his age, and, in his day, not without his own triumphs in the ring. The two best hunting geldings were of a very different sort—Mr. Papillon's, a smart, outstriding fashionable nag, and Mr. Barker's, a good old weight-carrying castle, that promised to go far ever at "a certain pace." One of the best of the hunting horses, the property of Mr. Du Cane, was, provokingly enough, placed in the extra stock, where he was paired by a clever Welsh pony of Mr. Oxley Parker's, that would as certainly have enjoyed some more satisfactory distinction in direct competition. Not that the pony class was by any means short of an entry, running up as this did to nearly thirty, and including almost every possible illustration of the sort, from the diminutive Shetland or elegant Arab, to the fourteen hands' cob, or common carrier's slave. With no restriction as to height, a very smart serviceable black cob was declared the winner; Mr. Fisher Hobbs' grey succeeding to second, after a division between the judges as to her really useful qualities, when opposed to a varmint little cheesnut of Mr. Barker's, with beautiful shoulders and indisputable action. The definition of "a hack" has always been something of a difficulty, and the conditions of the society offering no solution to the enigma, the premium went to a smart steeple-chase horse; the best of the hack mares being another of Mr. Barker's, more in character with her class. Mr. Disney's one-eyed brood mare was a long way superior to her company; Mr. Biddell's leggy cheesnut enjoying the negative merit of being the next best of a rough lot. The latter at five or six years old having never had a bridle on, shows no signs of work or blemish, not much of a merit under the circumstances. By way of amending her want of depth and substance, her owner has crossed this nearly thorough-bred cheesnut mare with one of his cheesnut Suffolk stallions, an experiment that is at least notable for the boldness of the idea, whatever may come of it. Some of these riding and coaching premiums are very openly worded, and it might be as well that the object was a little more clearly defined, as, for instance, in the matter of height for hacks and ponies, and in purpose for mares and foals. In the absence of any such conditions exhibitors naturally interpret everything after their own hearts' desires. The Society, again, would not be doing amiss in limiting the Veterinary Inspector's services to that he is engaged to do, instead of his assuming to the command of everything and everybody whenever it pleases him to interfere. One would have thought that a tolerably strong lesson had just been read in this way. No officer is more useful in his place, as we have always contended, and no one more objectionable when he ventures out of it.

The Cattle Show, as perhaps it ought to be, was clearly the most completely furnished division of the Society's programme; and the Shorthorns especially excellent. Mr. M'Intosh's three heifers, the long, level, and fashionable Lady Bates, with the companion heifer calves, both by the American bull, were a trio that for symmetry, style, and quality, will hold their own on any ground, and Mr. Piggott was quite satisfied with a commendation in such company. Then Mr. Clayden's Marquis of Cornwallis, with his good head and fine fore-quarter, was not only the best of the county class, but the judges dwelt for some time over his merits as compared with those of Duplicate for the champion prize. The latter, with a well covered top, great length, and capably let down from his quarter to his hocks, still stands badly before, as not quite right in his shoulders; but his hair and touch were superior to the Marquis', who handled a little hard, and Messrs. Ladds and Robinson, though they called in Mr. Thurnall for confirmation, were unanimous in their opinion as to a preference for quality, before their referee had given his decree. Mr. Clayden was first again with his young bull, also out of Miriam, and a deep, wealthy substantial specimen of her produce; whereas Mr. Sturgeon's second was but a plain, upstanding animal, by comparison, in a class, however, that received the compliment of a general commendation. Mr. Christy had a walk over with his two yearlings, who followed each other for first and second, while his good useful cow Primula has now won four years in succession at the Essex Show, commencing as a calf at Saffron Walden. Mr. Portway had a good really level Alderney, and Mr. Upson's shorthorn cow, with her great bag, looked all her recommendation for dairy purposes. Mr. Manfred Biddell won with two or three useful polled Suffolks, but the other breeds were not in much force, and the best fat cow—a very capital one, too—had this ominous entry attached to Mr. Clayden's name as her exhibitor:—"Johanna, by Fitzclarence (14522), dam Joan of Arc, by Vanguard (10994), has never had a calf; bred by Lady Emily Pigot, age 3 years 6 months." The prize ox was a wonder for its age at one year and eleven months, and the competition in these two extra classes altogether respectable, but confined entirely to the Shorthorn breed—a sort that has taken very firm root in Essex, with such men as Messrs. McIntosh, Bramston, Clayden, Sworder, Christy, Upson, Barnard, Piggott, Chaplin, Crisp, Sturgeon, Colvin, Lord Braybrooke, and Sir Thomas Lennard to develop its capabilities.

The Norfolk sheep, of which Mr. Portway was the chief exhibitor, had scarcely character enough for South-down Judges like Mr. Turner and Mr. Woods, who were more at home over Mr. Clayden's and Sir Thomas Lennard's samples of the Babraham flock. Mr. Clayden's old sheep has the great merit of a good back, and Sir Thomas' All-England ram is the good roomy sheep he gave a long price for at the last of Mr. Webb's sales. The Belhus shearlings, bred at home, were rather small and delicate by comparison, but they are kept very pure to their type, and will thus have a fair chance of training on. In a moderate class of longwools, Mr. Giblin's Cotswolds were protested against as unfairly shorn, after the award in their favour was given in, and they were disqualified in favour of Mr. Sexton's next. One of the best pens of sheep were the first-prize long-wooled ewes, all of very nice quality; and Mr. Archer's Oxford Down lambs were large and good, but they had pulled down the ewes terribly. The sheep show was, on the whole, not up to an average, and the pigs were also but a moderate lot, with the want of such exhibitors as Mr. Fisher Hobbs and Mr. Crisp very materially felt. In their absence, Sir Thomas Lennard and Mr. Sexton had it pretty much their

own way; Mr. Bramston facing the favourite blacks of these parts with some good sizeable Berkshires, one of which reached to a place.

Mr. Caldwell returned from his voyage of discovery without laying out much of his money: there was no new implement to encourage or improvement to register, so that our notice of the machinery will be best taken by the list of exhibitors, or of such as are pretty well known by their wares in the agricultural world. The majority were local men, but from further a-field were the representatives of W. Crosskill's house; Walter Wood, of Thames-street, London; Ashby and Co., of Stamford; Bradford, of Manchester; Garrett, of Leiston; Headley, of Cambridge; the Turners, of Ipswich; Woods and Cockledge, of Stowmarket; Burrell, of Thetford; and Boby, of Bury St. Edmunds; with Coleman, Bentall, Andrewes, Pertwee, Goas and Peene, Smyth and Sons, Gripper, Catchpool and Thompson, Darby, Warren, Wedlake and Dendy, and some others from within the limits of the county. The feature, however, of the implement department was the illustration of the different systems of steam culture as in action in a wheat stubble on the farm of Mr. Crump, who had left it undisturbed since harvest, and where there was consequently a fine crop of weeds and annuals. Mr. Forster, of Blunt's Hall, sent in the latest edition of Howard's apparatus, Mr. Christy a set of Fowler's tackle, and the Messrs. Coleman their own self-moving engine and cultivator. Both Fowler's and Howard's systems were well tried and proved in their performance of some effective rough every-day work, as entrusted to the common farm labourers; Howard's ploughing being very pretty, and Coleman's grubber still quite as effective under the new power, as a cultivator. But we must decline entreaching upon Mr. Caldwell's province as judge, although we believe he made no report upon the subject.

A really pleasant day, as it fortunately turned out, wound up with the customary dinner, on which we should also prefer not reporting at any great length. As had been anticipated, there was a considerable disturbance over the recent conduct of the Bishop of Rochester with regard to his clergy mingling with the farmers of the county. Not that the farmers present were by any means the first to provoke any angry discussion, which commenced the rather at the high table, where the chairman, Mr. Wingfield Baker, attempted to reprimand Sir Claude de Crespigny for expressing the pleasure he and his brother-volunteers had in "associating with farmers and markets." The meeting, however, very soon had their chairman to order, and then the Reverend J. Bramston rose to return thanks for his health, as it had been given, as the Vicar of the Parish. Instead of confining himself to this, as any discreet man would have done, "having a high notion of his own profession, and a great respect for *l'esprit de corps*," the Reverend gentleman, influenced by the worst possible taste, entered into a long, clumsy, meant-to-be-clever defence of the Bishop, that, to their credit be it said, the farmers of Essex sat still and heard out. We do not think that any other class of society would have "stood" it for half the time; but the meeting still never fairly recovered from the effect, and the chairman was hardly the man to put things straight again. He seemed to think more of airing his own ponderous verbosity than anything else, and instead of working smartly through his toast list, and getting up fresh speakers, he hung so long over his own magniloquent sentences, that when the practical business did come on, it was all too late, and the Lord of Miarule reigned supreme. But we must emphatically repeat, the farmers were not to blame for this. They were challenged into an expression of opinion, and then not suffered to give it. Only fancy a man at an agricultural gathering, of all other places,

elaborately upholding certain intolerant expressions as to farmers and markets, and the farmers themselves not being permitted to answer him!

PRIZE LIST.

HORSES FOR AGRICULTURAL PURPOSES.

JUDGES.—Stephen Cox, Blackfriars-road, London.
Thos. King, Preston Hall, Suffolk.
W. C. Spooner, Ealing House, Southampton.

Stallions having served mares in the county.—£15, A. B. Croxon, Burnham; £10, J. Oxley Parker, Woodham, Mortimer Place (Covehithe); £5, G. Carter, Danbury, Suffolk (Duke).

Entire Two-years-old Colts.—£10, W. Wilson, Moor Place, Stanford-le-Hope (Warrior); £4, Sir T. Barrett-Lennard, Bart., Belhus. Highly commended, H. Quinhampton, Little Totham.

Cart Mares, not under four-years-old.—£6, J. Claydon, Littlebury (Queen of Diamonds); £4, D. Sewell, Beasmont Hall, Colchester. Highly commended, Messrs. Woodward and Waller, Stanway (Diamond). Commended, D. Green, Berechurch, and Sir T. Barrett-Lennard (Canterbury Nan).

Mares, with Foals at Foot.—£10, G. D. Badham, Balmer (Brag); £6, Sir T. Barrett-Lennard (Blossom). Highly commended, J. Upson, Rivenhall.

Three-years-old Fillies.—£5, W. H. Walker, Wennington (Ruby); £3, T. Speakman, Fairstead.

Geldings.—£5, W. Hart, Blackmore. Highly commended, G. De Horne Vaisey, Star Stile, Halstead.

Two-years-old Fillies.—£5, J. Ward, East Mareson (Jewell); £3, G. D. Badham. Highly commended, J. Hutley, Rivenhall. Commended, J. Way, Yeldham.

Yearling Colts.—£5, H. Giles, jun., Great Clacton; £3, J. Claydon. Commended, W. Thompson, Thorpe.

Yearling Fillies.—£3, J. Claydon; £3, J. Ward. Highly commended, G. D. Badham.

Pairs of Plough Horses.—£5, E. Baldwin, Halstead. Commended, B. Page, Tolleshunt D'Arcy, and T. Taylor, Earl's Colne.

Best Cart Stallion, open to All-England.—£25, J. Brown, Felsted (Hero). Commended, G. Carter, Danbury (Duke).

RIDING AND COACHING HORSES.

JUDGES.—Henry Corbet, Central Farmer's Club, London.
Henry Thurnall, Royston.
REFEREE.—W. C. Spooner.

Thorough-bred Stallions.—£15, Sir T. Barrett-Lennard (Sir John Barleycorn). Commended, H. Westrop, Melford Place (Dr. Sangrado).

Hackney Stallions.—£10, H. Hamblin, Colchester (Young Fichwillow). Commended, G. Wright, West Burgholt (Hematio).

Hunting Mares.—No award.

Hunting Geldings.—£5, P. O. Papillon, M.P., London (The Conqueror). Commended, F. Barker, Ingatestone (France George), and J. Wrang, Takeley.

Hackney Mares.—£5, F. Barker (Kate); £3, G. C. Relfe, Leigh's Lodge. Commended, R. Taylor, Colchester.

Hackney Geldings.—£5, F. Barker (Bankrupt). Highly commended, F. Portway. Commended, J. Cooper, Great Totham (Turk).

Breed Mares and Foals.—£7, E. Disney, The Hyde, Ingatestone (Jezabel); £3, M. Biddell, Fyfield. Highly commended, for foal by Mainstone, J. Seabrook, Springfield.

Ponies.—£4, T. W. Lambert, Rainham; £2, W. Fisher Hobbs, Boxted Lodge. Highly commended, T. Justice, Margreting, and F. Barker.

Thorough-bred Stallion, open to all England.—£25, Sir T. Barrett-Lennard (Sir John Barleycorn). Commended, H. Westrop (Dr. Sangrado).

CATTLE.

JUDGES.—W. Ladd, Ellington, Hunts.
Joseph Robinson, Olney Bucks.
REFEREE.—Henry Thurnall.

Shorthorn Bulls.—£15, J. Claydon, Littlebury (Marquis

of Cornwallis), £8, C. Bennett, Harlow (5th Duke of York). Commended, Lord Braybrooke, Audley End (Lord Clyde).
Bulls of any other pure breed.—£10, Manfred Biddell, Playford (Suffolk).

Two-year-old Shorthorn Bulls.—£10, J. Clayden (Marquis of Cornwallis 2nd); £5, C. Sturgeon, South Ockendon Hall (3rd Kent Oxford). The class highly commended.

Two-year-old Bulls of any other breed.—No entry.

Yearling Shorthorn Bulls.—£8, J. Christy, jun. (Tragedian); £4, J. Christy (Guardian).

Yearling pure-bred Bull of any other breed.—£4, J. W. Morris.

Shorthorn Cows.—£10, J. Christy (Prima); £4, T. W. Brampton, M.P. (Princess Mary of Cambridge). Commended, J. Clayden (Luxury).

Cows of any other breed.—£4, P. Portway (Alderney).

Two-year-old Shorthorn Heifers.—£8, Lt.-Colonel S. B. Bagges Brice, Spains Hall, Finchfield (Sculley Girl); £4, T. W. Brampton, M.P. (Bella). Highly commended, C. Sturgeon (Cream).

Two-year-old Heifers of any other pure breed.—£8, W. Woodward, Earls Colne.

Shorthorn Yearling Heifers.—£5, D. McIntosh (Lady Bates 2nd); £3, J. Clayden (Brilliant).

Yearling Heifers of any other pure breed.—£3 Manfred Biddell (Suffolk).

Fat Oxen or Steers, not exceeding three years.—£5, J. Upson. Highly Commended, J. Christy, jun.; commended, J. Upson.

Fat Cows or Heifers.—£5, J. Clayden (Joanna).

Cows or Heifers for Dairy Purposes.—£8, J. Upson (Short-horn); £3, G. Taber.

Pure-bred Heifers not exceeding 12 and not under 6 months.—£5, D. McIntosh (Lady Oxford 5th); £3, D. McIntosh (Wellingtonia 2nd). Highly commended, Jonathan Husley; commended, J. Piggott, Beckingham (Clotilda).

Bulls of pure breed, not exceeding 12 and not under 6 months.—£5, J. Piggott (Dictator); £3 J. Portwee (Lord Balam).

Bulls of pure breed, open to all England.—£15, Wm. Swower, Stapleford Tawney (Shorthorn—Duplicate).

Other Shorthorn Cows.—£10, Rev. Charles Leigh, Gold-hanger; £5, J. Upson.

Other Two-year-old Shorthorn Heifers.—£6, W. Swower; £4, J. Upson.

Other Yearling Shorthorn Heifers.—£5, B. Tiffen, Lenden; £3, H. Quhampton, Little Totham.

Other Shorthorn Heifers, not exceeding 12 months, and not under 6 months old.—£4, J. Upson; £2, J. Upson.

SHEEP.

Judges.—James Turner, Seaford, Sussex.
S. Walton jun., Kestgrave, Suffolk.
Henry Woods, Merton, Thetford.

Southdown Rams.—£5, J. Clayden; £3, Sir T. B. Lennard, Bart.

Rams of any other Short-woolled Breed.—£5, P. Portway (Norfolk); £3, P. Portway.

Long-woolled Rams of any Age.—£5, G. M. Sexton (Cotswold); £3, G. Wood, Sible Hedingham (Cotswold).

Oxfordshire or Shropshire Down Rams.—£5, J. Giblin, Little Bardfield (Oxford).

Shearling Southdown Rams.—£5, Sir T. Barrett-Lennard, Bart.

Shearling Short-woolled Ram of any other breed.—P. Portway; 2nd, P. Portway.

Shearling Oxfordshire or Shropshire Down Ram.—£5, F. Smith, West Hammingfield (Shropshire).

Shearling Long-woolled Ram.—£5, G. M. Sexton; £3, Trustees of the late G. Ward, Great Bentley (Longwool).

Pens of Five Shearling Pure Down Ewes.—£5, Trustees of the late G. Ward; £4, Sir T. Barrett-Lennard, Bart.

Pens of Five Shearling Short-woolled Ewes.—£5, Mrs. Rebecca Carter, Helions Bumpsted Hall (Norfolk); £3, P. Portway (Norfolk).

Pens of Five Shearling Long-woolled Ewes.—£5, Trustees of the late G. Ward; £3, J. Giblin.

Pens of Five Ewes of any kind, with their Lambs.—£5,

James Archer (Oxford Down); £3, H. Moss (Shropshire). Commended, J. Archer.

Five Shearling Short-woolled Wethers.—£5, Lord Braybrooke; £3, Sir T. Barrett-Lennard, Bart.

Five Fat Shearling Cross-bred or Long-woolled Wethers.—£5, Sir T. Barrett-Lennard, Bart. (Down and Cotswold); £3, J. Cottee (Long-wool).

Rams of pure breed, open to all England.—£10, Sir T. Barrett-Lennard, Bart. (Southdown).

Highly commended.—T. Beale Browne, Salperton Park (Cotswold).

PIGS.

JUDGES (as for sheep).

Boars.—£5, Sir T. B. Lennard (black); £3, G. M. Sexton, Wharsted, Suffolk (black).

Boars, not exceeding 12 months.—£4, G. M. Sexton (black); £2, G. M. Sexton (black); commended, G. M. Sexton (white).

Sows in Pig.—£4, G. M. Sexton (black); £2, G. M. Sexton (black).

Sows with Pigs, Pigs not to exceed 12 weeks old.—£4, Sir T. B. Lennard, Bart. (white); £2, R. Stevens, Witham (Berkshire); commended, G. M. Sexton (white); commended, G. M. Sexton (black).

Pen of Three Sow Pigs, same litter, under 9 months.—£4, G. M. Sexton (black); £2, T. W. Brampton, M.P. (Berkshire).

EXTRA STOCK.

Highly Commended.—For Shorthorn Bull, J. Cousins; for Two Cotswold Rams, G. M. Sexton; for Two Fat Pigs, George Taber; for Brown Hunting Gelding, C. Du Case, M.P.; for Welsh Pony, J. Oxley Parker.

WOOL.

JUDGES.—T. Johns, Chelmsford.

Southdown, Ten Fleeces.—£3, G. M. Sexton.

Other Short Wools.—£3, Charles Sturgeon (Merino); Commended, F. Smith (Shropshire).

Long Wool.—£3, G. M. Sexton.

Half-bred Wool.—£3, James Christy, jun.

IMPLEMENTS.

JUDGES.—H. B. Caldwell, Leckham House, Chippingham.

New Implement.—£10, no award; second, £5, no award. £5, Darby, of Little Waltham, for patent horse-hoe. Highly commended, Headley, Cambridge, for the straw-carrier.

THE RUTLAND CLIPPING MATCH.

Rutland, as a county, has long been famed for its superior ploughing, its excellent breed of shorthorns, and long-woolled sheep, and if our first meeting held on Thursday, June 4th, augurs for good, we may hope to see it as equally famed for its sheep-shearing. This branch of agricultural improvement has been taken in hand by Mr. R. Lucas, of Edithwaston Hall, and we have the greatest confidence in its being carried out in that spirit which has hitherto made the owner of Edithwaston so popular as a British landlord and a keen sportsman. The match was held in a paddock close to the pleasure grounds, the trays being set in a straight line, and forming thirty-two pens, being twenty-seven in class 1 for men, and five in class 2 for youths under twenty years of age. The morning was beautifully fine for the occasion, and all the outside showed up. The sheep, which consisted of wether hogs of the improved Lincolnshire breed, in good store condition, were run three in a pen, and afterwards made as equal, in point of shearing quality, as possible. The names of the competitors were then called over alphabetically, and they drew their tickets out of a bag held by Mr. Wortley. This over, and each man opposite his pen, the word "off" was the signal for general stir along the whole line, which in itself was most lively. The first sheep was shorn of its fleece and returned to its pen in nineteen minutes, and was followed by others in rapid succession. No. 8 was the favourite. So it proved; his first sheep was beautifully shorn, but the second was not quite so well as the first; it seemed, to use a shearer's phrase, "loose-sided," but the third sheep was more like the first, and proved too much

even for the Andrews', who, it had been stated, were not to be beaten in England. The winner was entered by Mr. Lane, of Haydor Lodge, near Grantham. The winner of the second prize in this class is a Rutland man, but now living in Lincolnshire, and springs from a good old line of shepherds. The clipping in this class was generally good, and took the judges some time to award the premiums. In class 2 the clipping was fair, but certainly not what we should like to see; the youth sent by Mr. Byson, of Empingham, being placed first. Mr. J. Woods, of Hazelbeach, was on the ground in search of a person to meet Earl Spencer's man, winner of the first prize at Northampton, to shear two sheep in two hours for the sum of £5, and eventually made arrangements with the winner of the third premium in class 1.

The following gentlemen acted as judges: Mr. R. L. Heat-

ley, Hambleton; Mr. Pickering, Belmont Chase; and Mr. R. W. Morton, Oakham. The awards were as under:—

To the man who shall shear in the best manner three sheep within two hours: first premium of £3 to W. Brothwell, with Mr. Lane, of Haydor Lodge; second premium of £1 to Thomas Needham, with Mr. Vincent, of Harlaxton; third premium of 10s. to W. Andrews, sen., with Mr. R. L. Swingle, of Ketton; commended, Joseph Drake, with Mr. Simpson, of Oakham.

To the youth, under 20 years of age, who shall shear in the best manner three sheep within two hours: first premium of £3 to Smith Dale, with Mr. Thomas Syson, of Empingham; second premium of £1 to Edward Andrews, with Mr. R. L. Swingle, of Ketton, and third premium of 10s. to Mr. Rowland Rowell, of Ridlington (farmer's son).

SECOND SALE OF THE BABRAHAM SHORTHORNS.

Wednesday, June 24, was positively the last time on which Church Farm, Babraham, opened its hospitable gates to the general agricultural public. A railway, which the vigour of Mr. Brassey and the credit of the Great Eastern are carrying out with no mean rapidity, is being formed through the smiling expanse which for so many years has been a rallying point for eminent British and foreign breeders; but the master spirit which organized on the spot such solid excellence, and achieved such brilliant triumphs, has, alas! passed away for ever. For two years the glory of Babraham has been slowly fading. Before his career closed Mr. Webb had applied himself to a sale of his Southdowns, and it is only two months since that we devoted no inconsiderable space to recording the dispersion of the greater part of his Shorthorns. Wednesday's proceedings, however, still placed Babraham in a proud position, and showed that

"E'en in its ashes live its wonted fires."

It is true that Norfolk and Suffolk sent a comparatively small contingent, but now that the London and North Western has been carried through to Cambridge, communication has been much facilitated between the eastern and the northern and midland districts; and if Mr. Webb could but begin life over again, he would probably find that the influx of visitors would be larger than ever.

The hour fixed for the luncheon was twelve at noon, and the sale commenced at one; but, as usual, the morning was whiled away with an examination of the stock in the yards, and a few lots which were placed for inspection in an adjoining meadow, in the luxuriant grass of which their lower points were almost lost to view. The animals were, however, carefully inspected by a goodly company, comprising Lord Braybrooke; Mr. A. Pym; Mr. C. Sturgeon, South Ockendon; Mr. H. W. Beauford, Bedford; Mr. R. E. Oliver, Sholebroke Lodge; Mr. G. Atkins, Brammarsh, Cambridgeshire; Mr. G. Dreury, agent to the Duke of Devonshire; Mr. J. Culshaw, steward to Col. Towneley; Mr. T. Messenger, Wheyrigg, Cumberland; Mr. J. Gamble, Shouldhamthorpe, Norfolk; Mr. H. Aylmer, West Dereham, Norfolk; Mr. J. Christy, Essex; Mr. C. O. Eaton, Tixover, Stamford; Mr. D. R. Davies, Old Mere Hall, Knutsford, Cheshire; Mr. Clarke Irving, Sydney, New South Wales; Lieut.

Col. S. B. Ruggles-Brise, Spain's Hall, Braintree; Mr. J. Odams, Bishop Stortford; Mr. E. A. Fawcett, Childwick Hall, St. Albans; Mr. J. Clayden, Littlebury; Messrs. C. and R. Daintree, Fenton and Warboys, Hunts; Mr. Turville, agent of Mr. Bramston, M.P.; Mr. King, Mr. Colvin's steward; Mr. C. Barnett; Mr. Garrod, agent of the Duke of Rutland; Herr Fischer and Herr Gebhardt, from Germany; Mr. W. King, Brinkley Hall, Cambridgeshire; Mr. Lees, Reigate; Mr. Z. Walker, Birmingham; Mr. Burnell, agent of Mr. Frere, Norfolk; Mr. H. Biddell, Suffolk; Mr. Freeman, March; Mr. A. C. King, Deaning Hall, Newmarket; Mr. Howe, Broughton, Huntingdonshire; Mr. F. Marshall, Ulceby, Lincolnshire; Mr. C. W. Brierley, Rochdale; Mr. Foster, Killowe, Cumberland; Mr. Tunncliffe, Staffordshire; Mr. W. Rigden, Hove, Sussex; Mr. R. Parris, Beauchamp Roothing, Essex; Mr. Sadler, Colchester; Mr. G. R. Barclay, Kcevil, Fifeshire; Mr. Boys, Eastbourne, Sussex; Mr. S. Slater, Lincolnshire; Mr. T. Perkins, Triplow, Cambridgeshire; Mr. Trotter, Lincolnshire; Mr. G. P. Tuxford, London; Mr. Faber, Northall, Barnet; Mr. Fordham, Melbourn, Cambridgeshire; Mr. Pocklington, Boston; Mr. Perceval, County Down, Ireland; Mr. M. Joseph, Sydney, New South Wales; Mr. R. Sharp, Courtlands, East Grinstead, Sussex; Mr. A. Longmore, Rettie, Aberdeen; Mr. E. Lythall, Radford Hall, Leamington; Mr. Heselstine, Brigg, Lincolnshire; Mr. Hutton, agent for Lord Willoughby de Broke; Mr. L. W. Nidd, Creeton, Little Bytham, Rutlandshire; Mr. Simpson, Mr. Westley, and many other gentlemen whose names did not transpire.

The luncheon did not present much opportunity for a feast of reason or a flow of soul. Many of the visitors had come a considerable distance by the Great Eastern, the Great Northern, or the London and North Western, and were more intent on satisfying their physical requirements than hearing speeches; and when the inner man was satisfied, the hour had arrived when Mr. Strafford had to wave aloft the glass, which must have "run" in every county in England, to say nothing of Scotland, Wales, or Ireland; and when his energetic colleague, Mr. J. C. Jonas, had also to occupy the rostrum with him. Nevertheless, Mr. Barnett, who again presided, supported on

the one hand by Mr. Clarke Irving, and on the other by Colonel Brise, essayed a few loyal toasts, which were "drunk upstanding and with all the honours." Then came a few sentences in praise of the Lord Lieutenant of the county and Mr. Strafford, who tried for a few words in reply; but seeing, with his usual tact, that the company were already on the move to the sale-ring, he cut it very short indeed, not forgetting, however, to impress upon his auditory the necessity of taking courage from Mr. Webb's illustrious example.

There was then a general resort to the open air. The auctioneer's waggon was soon crowded, and so were several others, conveniently arranged, ranged round the ring, while those who could not obtain sitting accommodation formed a circle, scarcely so thick perhaps as in former years, but still a highly respectable and imposing one. Mr. Strafford having read the conditions of sale, said the first lot, Lady Sixtus, a red and white cow, calved October 29, 1847, by Paris, dam (Countess) by Vanguard, grandam Dodona, had had twelve calves, and had been bulled May 27th, by Lord Chancellor. She was descended from a cow which he bought for Mr. Webb, from Earl Spencer, 24 years since, and her great grandam was bred by Mr. Mason, of Cheltenham. The biddings commenced at 10 gs., went at two strides to 20 gs., and then more slowly to 24 gs., at which price Mr. Freeman, from the neighbourhood of March, was the purchaser. Lot 2 was Erminstade, a roan, calved September 11, 1853, dam of Sir Charles, winner of the first prize for bulls, offered for an All England competition by the Essex Agricultural Society, in 1861; she was purchased at the Fawley sale, in 1856, and was the only animal offered during the day, which was not bred at Babraham. Mr. Strafford stated that she gave six gallons of milk every day, and had had a heifer calf May 26th. The biddings began at 20 gs., and went without any very special animation to 40 gs., for which price Herr Fischer, of Saxony, was the purchaser. Lot 3 was Merry May, a red and white cow, calved January 18, 1854, by Lord of the North, dam Lady Sixtus, grandam Countess, bulled February 4, by Guelder Rose; Mr. Strafford announced that she had bred eight calves, and that her mother was also a very good breeder; the biddings opened at 20 gs. and went steadily to 34 gs., at which sum the lot was knocked down to Mr. A. C. King, Deaning Hall, Newmarket. Lot 4, Lady Elizabeth 2nd (a roan cow, calved March 16, 1855, by Marquis of Bute, dam Countess of Hardwicke), was the only daughter left of the Countess of Hardwicke; and Mr. Strafford added that she was a granddaughter of Celia, from which fruitful source Mr. Webb had bred 180 animals; there was a better competition for this lot, the biddings began at 20 gs. and soon went up to 40 gs., from which point, after an entreaty from the auctioneer to "look at that back," they were carried to 50 gs.; Mr. J. Howe, of St. Ives, was the purchaser on these terms. Lot 5, Buttercup, a red cow, calved June 29, 1855, by Cheltenham, dam Ladybird, was bulled, May 16, by Prince Gwynne, and has had six calves. She was a cow, Mr. Strafford said, of a sort such as Lord Spencer bought, to breed a bull from. The bid-

dings, which commenced at 20 gs., went quietly up to 45 gs., given by Mr. E. A. Fawcett, of Childwick Hall, St. Albans. Lot 6, Chesterford Duchess, a red and white cow, calved October 6, 1855, by Lord of the South, dam Countess of Mexborough, was bulled as far back as October 12, by Englishman, and had her last calf in September, 1862; this seemed a more favourite cow, as the competition, which began at 25 gs., went in five strides to 50 gs., and then more quietly to 62 gs.; Mr. F. Marshall, of Ulceby, in Lincolnshire, was the purchaser. Lot 7, Marchioness of Worcester, a roan cow, calved March 9, 1856, by Marquis of Worcester, dam Merry May, has had five calves in seven years, and was bulled June 8 by Prince Gwynne; it may also be noted that she received the prize offered for shorthorn cows at the Halstead meeting of the Essex Agricultural Society; the biddings began high—50 gs.—and went by 5 gs. at a time to 65 gs., for which the lot was acquired by Mr. C. W. Brierley, of Rochdale. Lot 8, Dairymaid, a red cow, calved May 24, 1857, by Young Cheltenham, dam Ladybird, was bulled May 14, by Prince Gwynne; her dam has gone to Australia. At Mr. Atkins's sale, Mr. Strafford stated, twenty of this family averaged nearly 70 gs. each. The biddings began at 80 gs. and went by easy stages to 46 gs., for which Mr. D. R. Davies, of Mere Old Hall, Knutsford, Cheshire, became the purchaser. Lot 9, was Young Celia 3rd, a red cow calved June 6th, 1857, by Young Cheltenham, dam Young Celia. There was some uncertainty as to the circumstances under which she was last bulled; she is in calf, but whether by Young Duke of Cambridge, Elfin Prince, or English Gentleman, is a matter of doubt. Her last recorded bulling was August 10th, 1862, and she is supposed to have taken a bull since, but the fact was not properly reported by the herdsman. The bids began at 20gs., and were carried quietly, after a full explanation of the circumstances by Mr. Strafford, to 42gs., for which Mr. Foster, of Kellowe, Cumberland, was declared the buyer. It was stated on the auctioneer's waggon that Mr. Foster is a London merchant who has recently commenced farming in Cumberland. Lot 10, Lady Alice Burdett, a roan cow, calved July 22, 1857, by Young Duke of Cambridge, dam Lady Elizabeth 2nd, was bulled Nov. 7th, by English Gentleman; the biddings began at 20gs., and were soon run up to 51gs., for which sum Mr. J. Marshall, of Ulceby, Lincolnshire, acquired the lot. The next lot, Lady Augusta Burdett, a roan cow, calved July 5th, 1858, by Young Duke of Cambridge, dam Lady Elizabeth 2nd, was bulled Oct. 9th, by Englishman; the biddings commenced at 30gs., went at once to 40gs., and then by 2gs. and 3gs. at a time to 60gs., for which the lot was knocked down to Lord Braybrooke (Essex.) Lot 12, Milkmaid, a red and white cow, calved July 26th, 1858, by Earl of Hardwicke, dam Ladybird, was bulled June 22nd, by First Fruits, and calved last in March; this cow, which is of the Sylph family, was called in at 20gs., and after some regular bidding went at 43gs. to Mr. D. R. Davies, of Mere Old Hall, Knutsford, Cheshire. Lot 13, Miss Cantab, a roan cow, calved Sept. 5th, 1858, by Young Duke of Cambridge, dam Countess of Caledon, had a calf in February, and was bulled May 12th by First Fruits; she

was called in at 35 gs. by Mr. Clarke Irving, but provoked only two subsequent biddings, being taken at 37 gs. by Mr. P. B. Colvin, of Fiahbiury Park, Harlow, Herts. Miss Emily 2nd, a red cow, calved Sept. 14th, 1858, by Earl of Hardwicke, dam Young Celia 2nd, was the next lot; she had been bulled May 7th, by First Fruits, and began at 25 gs., going for 48 gs., after pretty well-sustained bidding, to Mr. Tunncliffe, of Staffordshire. Lot 15, Nelly Bly, a red and white cow, calved June 30th, 1859, by Sir Charles, dam Young Celia 3rd, was bulled March 30th, by First Fruits; she began at 25 gs., and went steadily to 42 gs., then at once to 50 gs., and then more slowly to 67 gs., Herr Fischer, of Saxony, being the purchaser at that rather heavy price. Lot 16, Lady Eleanor—a red and white cow, calved July 30, 1859, by Earl of Hardwicke, dam Lady Eric—was descended rather remotely from Dodona; she was bulled Feb. 25 by Usurer, and calved in December, 1862. She was called in at 40 gs., and went, after a few bids, to Mr. C. O. Eaton, of Tixover Hall, Stamford, who paid 50 gs. for her. Lot 17, Michaelmas Day—a white cow, calved Oct. 11, 1859, by Sir Charles, dam Lady Alice Burdett—was bulled May 6, by Lord Chancellor. She began at 20 gs., and was acquired, after some rather long but not particularly animated bidding, for 41 gs., by Mr. Clarke Irving, of Sydney. Lot 18, May Duchess—a red cow calved Feb. 21, 1860, by May Duke, dam Merry May—had recently calved, but was stated to have been bulled that morning (June 24) by Lord Chancellor. Mr. Strafford also intimated that she was an excellent milker, giving six gallons of milk daily. The biddings commenced at 20 gs., went at once to 30 gs., then to 35 gs., and then more slowly to 55 gs., for which Herr Fischer was the purchaser. Lot 19, Evangeline—a red and white cow, calved Feb. 28, 1860, by Sir Charles, dam Mocking Bird—was bulled June 3, by Prince Gwynne. She was called in at 25 gs., went at once to 35 gs., and was finally knocked down at 40 gs. to Herr Gebhardt. Lot 20, young Celia Sixth—a red cow calved March 12, 1860, by Young Duke of Cambridge, dam Young Celia—was bulled June 13 by Prince Gwynne. She has had two calves, and was described as "another extraordinary milker." The biddings commenced at 25 gs., went at three strides to 30 gs., and finally finished at 44 gs. in favour of Mr. C. Daintree, of Fenton, Hunts. Miss Emily Third—a red cow, calved April 15, 1860, by Prince of Prussia, dam Young Celia Second—was the next lot, commenced at 25 gs., and was obtained without much difficulty at 32 gs. by Mr. R. Parris, of Beauchamp Roothing, Essex. Lot 22, Mildred Rose—a red cow calved June 13, 1860, by Young Duke of Cambridge, dam The Beauty—was bulled Dec. 13 by Englishman. She has only had one calf, and is half-sister to Red Rose and Drawing-room Rose, which sold at such a thumping price at the last sale. For this lot there was some very spirited biddings. The first offer was 30 gs., the next 31 gs., the next 40 gs., the next 50 gs., the next 60 gs., the next 65 gs., and the next 75 gs. Here there was a little pause, which Mr. Strafford dexterously filled up by observing, "Why, I thought you would have put her up at 100!" Then the bidding went to 90 gs. and 100 gs., and then,

by the prescribed 5 gs. at a time, to 145 gs., for which liberal "figure" Mr. D. R. Davies, of Cheshire, became the purchaser. Lot 23, Songstress, a red cow, calved June 25th, 1860, by Lord Derby, was bulled March 26th, by First Fruits; the biddings commenced at 20 gs. and closed rather quietly at 35 gs. in favour of Mr. Howe, of St. Ives. Lot 24, Patchwork, a red cow, calved Sept. 15th, 1860, by Lord Derby, dam Lady Mary Craven, was bulled Dec. 4th, by English Gentlemen. This lot is distinguished by a freak of nature in her colour—hence her name; she began at 30 gs. and went rather sluggishly to 43 gs., for which she was knocked down to Mr. Sadler, of Colchester. Lot 25, Welcome Lass, a red and white cow, calved Sept. 15th, 1860, by Sir Charles, dam Young Celia 4th, was bulled Sept. 22nd, by Usurer, and was one of the heifers shown by Mr. Webb, at Battersea; the first bid was 30 gs., the second 40 gs., and the lot finally went at 45 gs. to Herr Gebhardt.

Mr. Jonas now presented himself, with his hammer, and proceeded to call attention to the next lot—Fleur de Lis, a red cow, calved Oct. 6th, 1860, by Lord Royston, dam Duchess de Maille. She was bulled Feb. 23rd, by First Fruits, and began at 20 gs., from which she went rapidly to 40 gs. and then by single guineas, but still with much animation, to 66 gs., the competition being between Mr. Clark Irving, and Mr. Walker of Birmingham. After a little hesitation the biddings were carried to 70 gs.; but they did not stop there, going by easy stages to 76 gs., Mr. Irving finally clenching the business by giving 80 gs. Mr. Irving intimated to the gentlemen immediately about him, that in making the purchase he was not acting on his own behalf, but for Mr. J. Petre. The next lot was Cream Jug, a red cow, calved Nov. 18th, 1860, by Lord Royston, dam Milkmaid, bulled March 24th, by First Fruits; the biddings opened at 30 gs. and went steadily to 52 gs., for which sum Mr. H. Aylmer, of West Dereham, Norfolk, acquired the animal. Lot 28, May Queen, a roan cow, calved Feb. 16th, 1861, by Sir Charles, dam Merry May, opened at 20 gs., was soon at 30 gs., and finally closed at 47 gs., Mr. G. R. Barclay, of Keovil, Fifeshire, being the purchaser; she has recently calved. Lot 29, Expectation, a red heifer, calved March 19th, 1861, by Sir Walter Raleigh, dam Miss Abigail, was twin to a bull; she was bulled Oct. 23rd, by Guelder Rose, but did not appear to be in-calf. The biddings opened at 15 gs., and closed quietly at 27 gs., the lot, which was described by Mr. Jonas as one of "great expectations," going to Mr. Boys, of Eastbourne, Sussex. Lot 30, Lady Battersea Yorke, a white heifer, calved July 15th, 1861, by Count de Gourcy, dam Lady Elizabeth Yorke, was bulled Feb. 7th, by Lord Chancellor; her dam was the third prize cow at Battersea; the biddings opened at 20 gs., and closed at 36 gs. in favour of Mr. A. C. King, of Desning Hall, Newmarket. Lot 31, Countess de Gourcy, a roan heifer, calved Sept. 8th, 1861, by Count de Gourcy, dam Merry May 2nd, was bulled June 20th, by Lord Chancellor; there was some animated bidding for this lot, the competition opening at 25 gs., and being steadily carried to 49 gs., at which Mr. S. Slater, of North Carlton, Lincolnshire,

was the purchaser. Lot 33, was Miss Burdett Coutts, a red and white heifer, calved Oct. 6th, 1861, by Englishman, dam Lady Augusta Burdett, bulled March 8th, by Prince Gwynne; the biddings opened at 25 gs., went in two strides to 80 gs., and then steadily by a great number of bids to 40 gs., 50 gs., 60 gs., 70 gs., 80 gs., 90 gs., and 91 gs., at which Mr. Barclay, from Fifeshire, acquired the lot: the biddings lay principally between Mr. Barclay and Mr. Irving. Lot 33, May Daisy, a red and white heifer, calved Dec. 16th, 1861, by Sir Charles, dam Merry May, had been bulled, it was stated, that morning (June 24), by Lord Chancellor; the biddings commenced at 25 gs., were soon at 30 gs., and then went more quietly to 38 gs., at which the hammer fell in favour of Mr. T. Perkins, of Thriplow, Camba. Lot 34, White Lily, a white heifer, calved Jan. 9th, 1862, by Usurer, dam Michaelmas Day, began at 20 gs., and after rising steadily to 36 gs., was adjudged to Mr. Foster, of Cumberland. Lot 35, Miss Cantab 2nd, a white heifer, calved March 33rd, 1862, by Usurer, dam Miss Cantab, opened at 20 gs., and closed at 30 gs., in favour of Mr. Trotter, of Lincolnshire. Lot 36, Phillis, a roan heifer, calved March 27th, 1862, by Young Duke of Cambridge 2nd, dam Milkmaid, began at 25 gs., and went for 36 gs., to Mr. C. O. Eaton, another Lincolnshire visitor. Lot 37, Miss International, a red heifer, calved April 10, 1862, by Sir Charles, dam Marchioness of Worcester (a Battersea cow), commenced at 25 gs., and was acquired at 43 gs., by Herr Fischer. Lot 38, Miss Emily 4th, a red heifer, calved May 23rd, 1862, by Englishman, dam Miss Emily 3rd, elicited a first bid of 20 gs., and the hammer fell at 31 gs., in favour of Herr Fischer. Lot 39, Merry Bly, a red heifer, calved July 14th, 1862, by Sir Charles, dam Young Celia 3rd, began at 20 gs., and was purchased at 33 gs., by Herr Gebhardt. Lot 40, Lady Marion, a red and white heifer, calved Sept. 16th, 1862, by Sir Charles, dam Chesterfield Duchess, came from a family which has proved highly lucrative to Mr. Webb; the biddings commenced at 15 gs., and closed at 31 gs., which was offered by Mr. J. Clayden, of Littlebury, near Saffron Walden, for Lieut.-Colonel Brise, Spain's Hall, Braintree. Lot 41, Patchwork 2nd, a red heifer, calved October 10th, 1862, by Tally-ho, dam Patchwork, did not reflect the freak of nature observable in the dam; the competition commenced at 20 gs., and closed at 31 gs., in favour of Herr Fischer. Lot 42, May Tulp, a red calf, born Nov. 3rd, 1862, by Grand Duke, dam Merry May, commenced at 20 gs., and went at 22 gs., to Mr. Faber, of Northall, near Barnet. Lot 43, Miss Emily Knightley, a roan calf, born Nov. 29th, 1862, by Sir Charles, dam Miss Emily 2nd, began at 20 gs., and provoked a more animated competition, the biddings rising to 41 gs., at which Mr. Fordham, of Melbourne, Cambridgeshire, was the purchaser. Lot 44, Lady Ontario, a red and white calf, born Dec. 2nd, 1862, by Sir Charles, dam Lady Eleanor, is a sister of Lady Superior, which made 195 gs. at the last sale; the biddings opened at 20 gs., and closed at 31 gs., in favour of Herr Fischer. Lot 45, White Violet, a white calf, born Dec. 29th, 1862, by Tally-ho, dam Michaelmas Day; opened at 10 gs., and was acquired for 18 gs. by Mr. Pocklington, of Boston. Lot

46, May Blossom, a rich roan calf, born Feb. 11th, 1863, by Young Duke of Cambridge 2nd, dam Lady Sixtus, provoked a better competition, beginning at 10 gs., and being carried to 26 gs., at which price Mr. S. Perceval, of County Down, Ireland, was stated to be the purchaser. Lot 47, Miss Cantab 3rd, a roan calf, born Feb. 21st, 1863, by Grand Duke 3rd, dam Miss Cantab, commenced at 10 gs., and was taken at 17 gs., by Mr. Brierley, of Rochdale. Lot 48, Bahrahm Duchess, a roan calf, born May 1st, 1863, by Gnelder Rose, dam Young Celia 6th, began at 10 gs., and worked slowly up to 22 gs., given by Mr. J. Christy, of Boynton Hall, Chelmsford. Lot 49, Fawley Maid, a red and white calf, born May 26th, 1863, by Lord Chancellor, dam Erminstade, commenced at 10 gs., and doubled the price before she was knocked down to Mr. Bowyer. Rose of Denmark, the last calf announced for sale, was stated to have died during the last few days.

Now came the bulls. Mr. Strafford again resumed his cherished glass, and called in England's Glory, a roan, calved Oct. 29th, 1861, by Englishman, dam Lady Ducie, which was put up at 20 gs., and went swiftly up to 40, 50, 60, 70, and 73 gs., for which Mr. Clarke Irving became the purchaser. Lot 2, Sailor Boy, a red bull, calved April 16th, 1861, by Sir Walter Raleigh, dam Miss Emily, was put up at 50 gs. by Mr. Clarke Irving; the high price with which the lot opened seemed, however, to cool the courage of the company, and the biddings could not be carried beyond 54 gs., at which Mr. M. Joseph, of Sydney, was the buyer. The next lot, Lord Chancellor, a red bull calved May 8, 1861, by Usurer, dam Red Rose, proved the great attraction of the day; his dam, it may be remembered, sold for 160 gs.; the first bid was 35 gs., the second 50 gs., the third 100 gs., and the fourth (made by Mr. Clarke Irving) 150 gs.: matters had not yet, however, by any means attained their climax; from the other side of the ring came a bid of 200 gs., then in three bids more 215 gs. was reached; then came an offer of 250 gs., and then "260 gs." was exclaimed by Mr. Clarke Irving; the distinguished Australian had, however, to deal with a long-parsed opponent, for the next offer made, with very little hesitation, was 300 gs.; Mr. Clarke Irving bid 320 gs.; his opponent instantly raised his price to 350 gs.; Mr. Irving rose once more to 360 gs., but he was speedily distanced by an offer of 400 gs.; "Let him have it," said the Australian; and "him," who turned out to be Mr. R. Sharp, late of Chepstow, but now of Courtlands, East Grinstead, Sussex, had it accordingly. Lot 4, First Fruits, a white bull calved Aug. 13, 1861, by Englishman, dam Welfare, which took the gold medal at Battersea, was awaited with some interest, but was not destined to make the great price given for his predecessor; he began with 100 gs., offered by Mr. Irving, and the biddings went rapidly by 10 gs. at a time to 160 gs.; Mr. Irving then asked whether the gold medal would be given with him; Mr. Strafford conferred with the executors, and replied that it would not, as it was regarded as a family heirloom, he added that Mr. Webb had been offered £600 for the bull when he was shown as a calf at Battersea; Mr. Wal-

ker, of Birmingham, who had been bidding persistently against Mr. Irving, offered "170 with the gold medal," and Mr. Strafford knocked the lot down to him: Mr. Walker, however, rejoined "It is not mine; I said 'with the gold medal:'" some confusion ensued upon this, and the lot had to be put up again, when Mr. Irving again offered 100 gs.; the previous prices bid were soon repeated, and Mr. Walker once more tendered "170 gs. with the gold medal," but Mr. Strafford refused the bid, and the lot went at 160 gs. to Mr. J. Odams, of Bishop Stortford. Lot 5, Prince Gwynne, a roan bull calved Nov. 20, 1861, by Sir Charles, dam Young Daffy Gwynne, provoked a first bid of 20 gs., and went in three bounds to 50 gs., at which price Mr. Strafford affirmed that he was as cheap as old rage, descended as he was from Robert Colling's herd. The biddings then went on rather slowly to 75 gs., and Mr. Walker, of Birmingham, told Mr. Strafford rather impatiently to get on; to which Mr. Strafford rejoined. "If you don't look sharp, you will get off"—a happy retort, which provoked a good deal of laughter. The biddings, which were confined to Mr. Irving and Mr. Walker, then went on to 94 gs., but arrived at that point, Mr. Irving said, "Let Mr. Walker have it;" and the auctioneer declared that Mr. Walker had got it. As Mr. Walker proceeded to write his cheque he shook his head at Mr. Irving, and intimated that he hoped to have a return match with that gentleman before he had done with him. Lot 6, English Prince, a roan bull calved June 5, 1862, by Englishman, the sire of First Fruits, dam Young Celia 6th, went more quietly. He began at 20 gs., went in two bounds to 30 gs., and then more soberly to 50 gs., at which Mr. Wealey was the purchaser. For the next lot, Sir Charles 2nd, a roan bull calved June 15, 1862, by Young Duke of Cambridge, dam Erminstade, there was more competition. The first bid was 30 gs., and although the rises were not so rapid, yet 40 gs., 50 gs., 60 gs., 70 gs., 80 gs., and 90 gs. were reached by degrees, Mr. A. Longmore, of Rettie, near Aberdeen, being the purchaser at that stiff price. Lot 8, Alderman Rose, a roan bull calved July 24, 1862, by Englishman, dam Mildred Rose, was offered by Mr. Jonas, who again appeared in the front, and described the lot as the last of the Beauty tribe, his dam having realized 145 gs. The first bid was 10 gs., and the lot went at 22 gs., to Mr. Faber. Lot 9, Lord Ernest Burdett, a roan bull calf born August 29, 1862, by Earl of Hardwicke, dam Lady Augusta Burdett, was the last of the

Earl of Hardwicke stock. The first bid was 15 gs., and he went at 25 gs., to Mr. Simpson. Lot 10, Comet, a red and white bull calf, born Sept. 6, 1862, by Crown Prince, dam Lady Alice Burdett, provoked more notice. Thus the biddings began at 15 gs., went at once to 20 gs., and then rose more slowly to 66 gs., paid by Mr. E. Lythall, of Radford Hall, Leamington. Lot 11, Whipper-in, a red bull calf, born Oct. 6, 1862, by Tally-ho, dam Dairymaid, began at 20 gs., and closed at 44 gs., Mr. Heseltine, of Brigg, Lincolnshire, being the purchaser. Lot 12, Mario, a red bull calf, born Dec. 27, 1862, by Young Duke of Cambridge 2nd, dam Songstress, commenced at 15 gs., and went quietly to 35 gs.; Mr. Hutton, acting, it was understood, for Lord Willoughby de Broke, obtaining the lot at that price. Lot 13, Babraham, a roan bull calf, born March 16, 1863, by Englishman, dam Milkmaid, began at 10 gs., and went at 30 gs., to Mr. Sadler, of Colchester. Lot 14, Rufus, a red bull calf, born May 18, 1863, by Remus, dam Miss Emily 3rd, opened at 5 gs., and was carried steadily to 22 gs.; for which Mr. L. W. Nidd, of Creeton, Little Bytham, Rutlandshire, obtained him. Finally, the cattle van, in which Mr. Webb's animals have been conveyed to almost countless exhibitions, was disposed of for 23 guineas.

The result of the sale of the entire shorthorn herd was officially stated to have been £8,027 5s., or an average of £55 7s. 2d. for each lot. Of the total of £8,027 5s., £3,455 11s. (showing an average of £54 17s.) was contributed by the competition of Wednesday; the 49 females offered having realized £2,233 7s. (being an average of £45 11s. each), and the 14 bulls £1,222 4s. (being an average of £88 6s. each). The result of the two sales—in April and this present month—may be comparatively indicated as under:—

APRIL.					JUNE.				
Hd.	Average.	Sum.			Hd.	Average.	Sum.		
	£ s. d.	£	s. d.			£ s. d.	£	s. d.	
29	51 15 6	2019	3 0	Celias	32	44 11 2	1425	18 0	
15	50 5 2	753	19 0	Dodonas	16	43 14 1	699	6 0	
11	55 7 3	609	0 0	Sylpha	7	44 8 0	310	16 0	
7	102 18 0	730	6 0	Beauties ...	3	198 9 0	595	7 0	
7	44 5 0	309	15 0	Bodices ...					
3	53 4 0	159	12 0	Gwynnes ...	1		96	14 0	
				Erminstade.	3	52 10 0	157	10 0	
82		£4571	14 0	First Fruits	1		168	0 0	
					63		£3455	11 0	

With this interesting statistical fragment we conclude our narrative of our last day at Babraham.

THE TREATMENT OF MILK-FEVER IN COWS.

SIR,—Some time since allusion was made in some of the London newspapers to the cure of some cows, belonging to the Marquis of Bristol, which were treated for milk-fever according to the directions given by Mr. Moore in his book, "Veterinary Homoeopathy." Believing that many farmers now suffer severe losses from this disease, I am induced to publish the result of my experience of this treatment.

In the months of September and October, 1862, three cows, belonging to Lord Bristol, were attacked by milk-fever after

calving, all of which were cured by the use of Mr. Moore's remedies. One of them was a severe case.

A fortnight ago I had another cow attacked, and very severely. She calved on Friday, the 23rd of May, and was apparently doing quite well until Saturday evening. I saw her that afternoon at three o'clock, and she was going on favourably; and when the cowman left her at seven o'clock there was no symptom of disease.

When the man came on Sunday morning, at five o'clock.

the cow was down with milk-fever, in a very aggravated form. Her head was very much affected, her neck wrung, all secretions stopped, and the extremities very cold. I gave immediately ten drops of tincture of aconite (first dilution), and an hour afterwards ten drops of belladonna (first dilution), and continued giving these medicines alternately, every hour, until eleven o'clock, when the symptoms became worse, and the cow began to swell very much. I then gave ten drops of caustic ammonia (first dilution) every twenty minutes, until three o'clock, when the swelling had subsided. During this stage the cow was very ill, and at one time the men watching her thought she was dead. I then gave arsenic, ten-drop doses (second dilution), every twenty minutes, until twelve o'clock at night: the cow continued sleepy and prostrate. We gave also brandy, two wine-glassfuls every two hours, beginning at four o'clock in the afternoon. After twelve o'clock the more urgent symptoms having abated, we gave the arsenic every hour, and continued giving it until twelve

o'clock on Monday, when we discontinued that medicine, and gave nuxvomica (of the first dilution), ten drops every two hours, giving half-a-pint of brandy every two hours also. This treatment was continued until Tuesday morning at two o'clock, when the cow got up: in the afternoon of that day she was able to walk out in a paddock, and the next day was perfectly cured. The general directions given by Mr. Moore as to turning, and the position of the cow, were attended to, and she had occasional injections.

I am sure that any person who will adopt the same treatment will obtain equally satisfactory results; and I believe that if taken in time almost every case will recover. I may add that I am equally convinced of the efficacy of the remedies recommended by Mr. Moore, both in lung disease and diarrhoea in calves.

I am, Sir, your obedient servant;

J. H. TURNER.

Little Horringer Hall, Bury St. Edmunds.

GAME DEPREDACTIONS ON FARMERS.—AN OVER-TRUE TALE.

At the recent anniversary meeting of the Royal Agricultural Benevolent Institution—a society formed for giving relief by way of pension to tenant-farmers or their widows—the chairman, Lord Dartmouth, referred to cases in the Society's report, as "nursed in a dry and business-like manner," which "showed strongly how sad were the reverses to which tenant-farmers and their families were exposed." Amongst these cases there is one of a widow who had become an object of the Society's benevolence through "the damage done to her by game and rabbits." Now, these game injuries are directly or indirectly the cause of far more of the ill success and sad calamities which occur amongst the smaller farmers than the general public have any idea of. Possibly the reader, who pays attention to the game question, may recollect a statement made in our number of December 21, 1861, on the authority of a tenant-farmer on a game-preserved estate in Hertfordshire. It was to this effect—that he, the tenant, before taking the farm, and knowing that the estate was infested with game, had spoken personally to the landlord, and was assured by him that the game should not be allowed to injure the crops, but he had no written agreement to that effect; that two tenants of adjoining farms were better off than himself, they having agreements in writing as to compensation for game damage; that the landlord having then become lunatic, and his estate being under the direction of the Master in Lunacy, the destruction of rabbits had been ordered, but then, in place of the rabbits, the gamekeepers, who unfortunately had not been discharged, had preserved hares more than ever, and had actually turned down no less than one hundred hares in the previous season, and that the increase of hares had rendered the injury to the crops by game greater than ever; and that our informant had in the previous year obtained only seven bushels of wheat from six acres of land "situate in the most game-infested part of his farm, although the seed was got in well, and produced a full plant, for, knowing the enemy he had to contend with, he had sown a large quantity of seed." Our informant also stated that his fellow tenants had presented a memorial to the Lord Chancellor on the subject of their game damages. This we found to be true, and in our number of January 10, 1863, we offered to our readers the material portions of that memorial with its results, namely, "a general reference to arbitration, and that to each of the memorialists

(two) a sum of £650, with all costs, was awarded." Knowing the property, we doubt whether such sums afforded any substantial compensation for the injuries inflicted on the crops of the memorialists.

But the tenant first referred to could obtain no compensation. He had no written agreement on the subject; he had trusted to the personal assurance of the landlord, and whatever the landlord might have done, had he retained his mental health, the managing agents could not or would not do anything to aid the too trusting tenant-farmer. Now, this man's case is a most melancholy one. He had occupied a smaller farm belonging, we believe, to the same proprietor, but on the outskirts of the estate, and not within reach of the great head of game, and, having had several very good seasons, he had done pretty well. Moreover, he was an industrious and persevering man, and thoroughly understood his business as a farmer. The farm we have previously referred to having become vacant, and, apart from the game, it was one of the best of its size in the district. Though somewhat larger than the farm the tenant, whom we will call Jones, then occupied, it was not a larger farm than the capital he possessed would enable him to work with every prospect of success. The sole difficulty was the game. Jones was known to be a good and industrious farmer, and the agents of the estate were quite ready to accept him as tenant of the vacant farm. He was advised, strongly advised—solely on account of the game by which it was infested—to have nothing to do with this farm, and he hesitated until he had seen the landlord, and received his personal assurance "that the game should not be allowed to injure his crops." Then, and then only, acting in the unbusiness-like way in which too many farmers act in regard to the hiring of their farms, did he agree to take the farm. Having entered upon it, he quickly found his skill and industry to be of no avail. In spite of careful culture, the arable land became year after year more and more overrun with weeds, for the game rendered his crops thin, and nothing he could do would enable him to keep the land clean. Then the seasons of 1860 and 1861 were unpropitious, the soil being a strong loam, and in those years the game may be said to have obtained complete dominion of the crops. Still there were some good meadows, which the game could not render altogether useless, and, by means of his dairy, Jones and his

wife—a most industrious woman—kept things afloat, and in the hope of some compensation for past damage by game, and in the expectation that under the direction of the Master in Lunacy the property would be eventually freed from game and gamekeepers, Jones struggled on. He was, however, every day falling into a worse position. His rent got into arrear, though he hoped that some, if not the whole of such arrear, would be allowed to him by way of compensation. About two years ago he had a serious illness, mainly brought on by mental anxiety induced by his fruitless struggle against game preservation, and he was never entirely himself afterwards. His wife's health also broke down, and she was compelled to try to recruit it by a temporary absence from home. Then in the latter part of last year came the arbitration, which ended in the award of the substantial sum of £650 to each of Jones's two neighbours. He had suffered as much as they had. His substance had been consumed by the game as theirs had been, but instead of the written agreement for compensation for game damage, which had at least served them as planks in shipwreck, Jones had nothing but the verbal promise of his landlord, now no longer a competent or accountable person, and the once strong and resolute man gave way under the burden. He pressed urgently for compensation, and was told he might quit the farm, the farm whereon he had lost all, for

by the spring of the present year the dairy was gone, nearly all his cows had been sold, and the prospect of grass down to the latter part of May appeared very precarious. Jones's neighbours knew that he felt his position to be a bad one—that he was despondent, well nigh hopeless. With a young family of seven children—the eldest twelve years, the youngest ten months of age—with little capital to take away from his farm if he were to quit it, the poor man's reason gave way, and, in a fit of insanity, he fell by his own hand. He had for some weeks rather moodily remained in his own business-room apart from his family, and one evening last month his wife, when preparing to take him some tea, was alarmed by the report of a gun in her husband's room. It was all over; the poor man had effectually destroyed his life. Every person in the district, who was acquainted with Jones and his position, regards him as a victim to game preservation. What is to become of his widow and children is a painful question. A stronger case for the interposition of the "Royal Agricultural Benevolent Institution" it would be difficult to conceive, and we trust that the attention of some of the philanthropic members of that Society may be drawn towards this lamentable and unmerited "reverse" of this farmer's family through uncontrollable obstacles to the successful pursuit of agriculture.—*The Economist*.

STEAM CULTURE MECHANICS.

"The Fiskens," as they are now, by way of distinctive pre-eminence, called, merit great praise for what they have done in the cause of steam-culture. It requires no lengthy demonstration to prove this; for although not the fathers of the steam-plough, as has already been shown, and although they have been obliged to disclaim the greater portion of their specification, they nevertheless follow close upon the heels of Hannam of Burcott Park, in reviving the problem of ploughing land by steam, the ploughs being set share to share, after it had passed through what may not inaptly be termed, in the history of the steam-plough, "the period of romance," into which it had been bewitched for a time by "Talpa," in his "Chronicles of a Clay Farm." But while we thus thankfully return them every commendation due to their enthusiasm and persevering advocacy in favour of the principle of the plough, we must, at the same time, acknowledge that the balance, or rather "see-saw principle" they have introduced, is scarcely less unfortunate than the talparian theory above; for if the latter is "the period of romance," the former is obviously that of "childhood"—two sets of Somerville ploughs "see-sawing" over the axle of the carriage. In other words, if we were the first to point out, in the columns of the *Mark Lane Express*, the cycloidal action of the rotary diggers, and the fallacy of the principle as advocated and patented by "Talpa," so we must now inform our readers that two Somerville ploughs playing at "see-saw" over a fulcrum is a movement in the wrong direction, and that we must give up all childish pastime of this kind by going back to the Glasgow experiment and Demerara practice, and improve upon the principles illustrated in M'Rae's steam-plough, before further progress can successfully be made in steam culture.

The steam-ploughs of the Fiskens, of Fowler and Greig, of Chandler and Oliver, and of Howard and Bousfield, consist of two sets of Somerville ploughs, or two sets of the old-fashioned beam-framed ploughs—the one set with right-hand turnovers, and the other set with left-hand

turnovers, similar in principle to what are shown in Pinkus's second patent, already noticed; the two sets being so united together by intermediate gearing that the one set cannot be lowered into action without raising the other set to twice the height necessary, and, *vice versa*, they cannot be raised out of action without lowering the other set to the position from whence they were raised to the extra height. In each example the intermediate gearing differs considerably from that of any of the other rival cases; but the details of mechanism which thus differ so widely are only so many mechanical equivalents for raising and lowering the two sets of Somerville ploughs, and these equivalents, and the peculiar combination which they form with the two sets of ploughs, are all that the respective parties can claim as their inventions. None of them, for example, can lay claim to the discovery of the Somerville plough, or of two-beamed and three-beamed ploughs, or the combination of two sets of such ploughs, or the principle of lowering one set into action when the steam-plough leaves the headland, or the raising of that set out of action when the implement reaches the opposite headland, and so on for the other set in the return movement, as has already been shown in our observations on Pinkus's problem, such being public property prior to 1840, the date of his patent.

To avoid misunderstanding, it may not be improper to observe, before noticing the peculiar mechanism of each of the above steam-ploughs separately, that hitherto we have taken it for granted that our readers are familiar with the principle upon which Somerville ploughs or many-beamed ploughs are constructed, which may be practically defined as exemplifying a series of two or more ploughs rigidly fixed together in a frame, thus forming a double, triple, or quadruple plough. Sometimes the set is placed on the diagonal plan, having a common beam, while, in other examples each turnover and share has its own beam, when the set is called a "two-beamed" or a "three-beamed plough." As the shares and turnovers are in advance of each other, the second turning the furrow slice into the track, path, or open furrow behind

the first, and the third turning its furrow-slice into the path of the second, and so on; the second beam is consequently longer than the first, and the third than the second; so that there is a sacrifice of the balance principle of the common single plough, so beautifully illustrated when it is being entered at the one headland, or being taken out of the ground at the other. Thus, when entering a wheel-plough, the ground under the wheel and the axle-beam are fulcrum, the beam-handles and frame acting as levers of the second kind; but at the opposite end of the ridge the ground under the heel of the plough is the fulcrum, the leverage then being of the first kind; or the plough may be taken out of the soil by lifting up the stile, when the ground under the wheel and the axle-beam are again the fulcrum, and the leverage that of the second kind, as above. In the case of the Rotherham plough this latter is always the practice, its heavy carriage pivoting the ground under the heel being used as the fulcrum.

This extra length of beam in the case of the second and third ploughs of a tri-furrow set, and second, third, and fourth ploughs of a four-furrow set, merits a special notice, as they require not only to be raised an extra height, but also take a much larger amount of muscular power on the part of the ploughman, either to raise the share of the front plough or the heel of the last one in the set, at the headlands.

It is, however, but justice to the general progress of things, to observe that, long before Lord Somerville's improvements in implements of this kind, double and triple beamed ploughs existed; so that, strictly speaking, the principle did not originate with his lordship. At the commencement of the present century—A.D. 1803, the date of his lordship's patent—he had plenty of double ploughs in the fields to contend with. Some of these differed with his own in a manner that called upon him to take up the pen in defence of his patent project, of which he was enthusiastically fond, like most patentees. Thus, quoting his lordship's own words from the "Dictionary of Agriculture," 1807, "It has been argued that a two-furrow plough, with a double mortised beam, has an advantage over that of the curved single beam, inasmuch as by a screw the beams can be brought nearer, or set more apart, for the purpose of cutting a wider or narrower furrow." And we may further observe that we make this quotation expressly for the purpose of showing those of our readers who may not be acquainted with the history of this kind of ploughs, or of two-beamed and three-beamed ploughs, that they were constructed in a vast variety of ways, and that, in adapting them to be hauled by steam-power, very little novelty can as yet be claimed by any of the above parties, so far as principle is concerned.

Fisken's Steam-plough.—Now that the whole of the rope system by which this implement was intended to be actuated has been disclaimed, it must be examined in a somewhat different light. But as no special provision is made for hauling it, either under the winding-drum system of Heathcoat, or any of the endless-rope systems, it consequently follows that, as a patented machine, it must still be actuated on the rigger principle—the heavy rope anchored at both ends being a fulcrum to this rigger system, the motive power being applied by the light hemp rope. In this respect it differs widely from any of the steam-ploughs under consideration subsequently introduced, and also from McRae's, already noticed, that preceded it. As a patent question this merits special attention, and as a mechanical proposition it is of still higher importance, for we have now to trace the motive power along the rapidly moving light rope, and the point where the force thus communicated is applied to the implement, so as to overcome the resistance of the set of ploughs in the land.

Without going into full [the] minutia of detail, we may

at once observe that the axle of the grooved drum which rotates under the rope is now the equivalent of the draught pin of the copse, the two bosses in which it works being the points to which the force is applied to the carriage frame of the implement. In McRae's plough it was applied at each end of the frame; but here, in Fisken's, it is applied about the middle of the carriage for both traverses of the ploughs. The two hind wheels and the two furrow wheels, together with the chief portion of the carriage frame, are similar in principle to those of McRae, of Pinkus, of Atkins, and of several others; but the peculiar mode of harnessing the steam-horse and yoking him to the implement is characteristically that of the rigger system. Strictly speaking, the carriage of Fisken's steam-plough is not hauled, but actuated along the anchored rope by a system of endless levers, similar to what an engine is worked along a railway, the rails being the fulcrum: or a traction-engine over the land, the ground under the wheels being the fulcrum.

Motion being given to the carriage as above, we have next to observe that the two sets of ploughs are hauled alternately in opposite directions by the two extremes of each axle working in two bosses in the side framing. In lowering the set into, or raising it out of action, these two bosses form together the fulcrum on which the bell crank, or, rather bent lever plough frame, balances in turn; so that the leverage is that of the first kind, and the pressure of the fulcrum, consequently, equal to twice the weight of the ploughs, multiplied by the difference of leverage, as the case, may be on each side the fulcrum. Each axle thus forms the draught-pin of the set of ploughs fixed upon it, similar in principle to the draught-pin of the two and three beamed horse-ploughs of the olden time; and also to the two sets of ploughs in Pinkus's second patent (1840). There is a difference, however, in the leverage, the latter (those of Pinkus's) being of the second kind and sometimes those of the horse-ploughs also, so that the pressure upon the fulcrum or draught-pin in them was only a fractional part of that of the weight of the ploughs. In McRae's example, again, each plough in the set is hauled by its own draught-pin, which also forms a fulcrum in the raising and lowering of it, the leverage being that of the second kind. But the body of each plough is raised and lowered by a leverage system of the first kind, balancing over the pin at the top of the upright bar, which thus forms its fulcrum, as formerly noticed. The mechanical equivalents for raising and lowering Fisken's plough are, therefore, the winch-handle, screw, sector, and slotted lever; the winch-screw, and sector being similar to those of Uley's cultivator.

The peculiar characteristic, however, that distinguishes Fisken's mode of raising and lowering his two sets of ploughs is that which has fallaciously been termed the "balance principle," or "the principle of counterpoise," or "the see-saw principle;" the two sets of ploughs being so connected by the intermediate gearing just mentioned, viz., the winch-lever, screw, sector, and slotted lever, that the one set cannot be lowered into the ground without raising the opposite set double the height necessary on Pinkus's plan, or what is required when each set is lowered or raised separately. It has already been shown, under horse-culture, that the plough enters the ground by the joint action of two forces—gravity and traction; and so essentially necessary is the former, that we have been obliged to increase the weight of the plough in order to enter and keep it in the ground. Were a plough no heavier than a common hoe, it would be deflected upon the surface in a manner too familiar to require explanation; for before it will enter below the surface and cut weeds, a considerable pressure has to be applied to the handle, as every hoer can verify from his experience. Just so is it with the pseudo-balance-plough of Fisken. On the headland both

sets are above ground, as in Pinkus's patent of 1840, and also M'Rae's of 1839, with this difference when compared with the latter—that the second plough in Fiskien's set and in Pinkus's set is raised a stage higher than the first, at a corresponding sacrifice of power and tear-and-wear of the working parts in operation, while the third plough in the set is raised two stages higher than the first, the mechanical loss sacrificed being double that of the last, and so on for every additional plough in the set. On entering or lowering into action M'Rae's ploughs, the ploughman, on working the hand-levers, gains the full benefit of their weight or force of gravity; so that if he is an active hand, he can enter his ploughs with greater ease and regularity than in the case of the common horse-plough; consequently he makes better work, at the entering—or, as it is in some districts technically termed, the "in-going"—under steam-culture than under horse-culture with single ploughs. No doubt, the best ploughmen will have to serve an apprenticeship at the headland before they can work the levers of M'Rae's steam-plough successfully, and no doubt also a large number will never be able to enter the ploughs properly; but this is just what is experienced in horse-culture, and therefore it forms no valid argument to the contrary. The Fiskiens, on the other hand, sacrifice the force of gravity at the in-going, in order to gain a very inestimable counterpoise action at the out-going. If we suppose the friction of the screw, sector, and slotted lever *nil*, and the ploughs ascending and descending in free space, then there is a very nice hypothetical theory involved; but, unfortunately, both these hypotheses are fallacies, so that the practice in the field is the very opposite of this beautiful fire-side theory, the friction of the intermediate gearing and the resistance of the soil being something considerable. What the exact amount of either may be cannot be estimated, as they will depend upon the peculiar data of each individual case. But, generally speaking, the friction of a screw working in a sector will go far to counterbalance the action of the ploughs on the other side of the fulcrum—supposing the opposite set of ploughs disengaged, as they partially are at their entry—if it does not do it altogether; while the resistance of the soil will depend upon its hardness, and how the ploughman times the revolutions of the handles of the winch and the lowering process to the tractive force and velocity of the implement as it enters the soil. Owing to the forked lever plough-beams being longer than the other end of the bent lever to which the connecting-rods are attached, the force which the screw and sector have to balance is very great—equivalent, perhaps, to between two and three times the weight of the three ploughs, supposing three in the set. We never measured the length of the leverage on either side of the fulcrum, and the angles at which the forces act, to see what the actual difference was; but if the leverage on the plough side is double or triple that on the other, so is the force double or triple that of the weight of the ploughs. This force, too, is active, there being always one set of ploughs raised, and, what is worse, when the ploughshares of the opposite set come against a stone, or other obstruction in the soil, so as to check for a moment the uniform progress of the implement, the elevated set have a downward central action, owing to their being above the level of the axle on which they are fixed; so that the tear-and-wear upon the intermediate gearing is something excessive. Moreover, the counterpoising action of the opposite set of ploughs, granting that the friction of the intermediate gearing is *nil*, does not obviate this objection, but the contrary, the enormous pressure and tear and wear on both sides being equal. It is, however, but justice to observe that the friction of the screw

and sector is in favour of Fiskien's steam plough, when compared with Fowler's implement, as will subsequently be shown, as the up set of ploughs have very little tendency to pull the down set in action out of the ground.

It has been said above that the down set of Fiskien's ploughs are partially disengaged from the counterpoise action of the opposite set, at the ingoing process; consequently the expenditure of muscular force required to enter the former is equivalent to that required to raise the latter, the former being left to enter by gravity and traction. This will be found the practice when the ploughman times the lowering process of the intermediate gearing to the ingoing of the shares into the soil; for, if under such circumstances the connecting-rods that unite the crank levers to the slotted lever are examined, they will be found inactive, and not sustaining the counterpoise action, that being now done by the ploughman at the winch-handle. When the ground is hard, force may be applied in the opposite direction from that of the counterpoise of the up set of ploughs, so that by applying an extra force to the winch the ploughman may assist in putting in his ploughs, just as M'Rae's ploughman can do by lifting upwards his lever handles at the ingoing.

From headland to headland or along the land there is little difference between Fiskien's implement and McRae's, both sets of ploughs in action being then rigidly fixed in a frame, each borne on four wheels; supposing the latter should have adopted this plan, as shown in his specification.

At the outgoing, when Fiskien's steam-plough reaches the opposite headland the same number of revolutions of the winch-handle have to be made by the ploughman, raising the down set of ploughs out of the ground, as was experienced at the ingoing process, so that the benefit gained by the counterpoise of the opposite set is very problematical, especially as compared with McRae's implement; while the latter makes good work, and the former bad, owing to the last plough in Fiskien's set being raised before the first. From time immemorial double and triple beam framed ploughs have been condemned for this bad work at the "ingoing and outgoing" under horse culture, and sound practice with science admits of no other conclusion under steam-culture.

But independently of this objection to the quality of the work at the outgoing, we aver that McRae's ploughs can be raised with a less expenditure of muscular power than Fiskien's. In examining this question it must be borne in mind that the ploughs are relieved from the weight of the furrow-slices, and thrown half out of action, by the mere hauling of the furrow-wheels on to the headland. This is common to both implements, and indeed to all steam-ploughs having one or more carriage-wheels travelling in the furrow.

The conclusion, therefore, is manifestly this: that the little advantage gained at the outgoing of Fiskien's steam-plough does not compensate for the heavy sacrifices at the ingoing and along the field. This is all the more to be regretted, inasmuch as the mechanical defects which we have pointed out could easily be obviated without departing from the general mechanism of the implement, such as the forked-levers, bell-crank, connecting-rods, &c.; and were this done, and the necessary provision made for hauling the implement on the winding-drum and endless-rope systems, its mechanical merits and effective working at the headlands would doubtless occupy a more prominent position than ever it otherwise can do.

ENGINEER.

AGRICULTURAL PROGRESS IN CANADA.

The approaching Great Provincial Agricultural Exhibition, to be held at Kingston, in September, suggests a brief review of the progress of Canada, in those annual displays of the development of her agricultural industry. It was not till the year 1820 that the Colonial Government took any decisive step to foster the agriculture of the country, by "an act to encourage the establishment of agricultural societies in the several districts of the province." As early as the year 1825, agricultural societies, it is believed, existed in two or three districts, but no records have been handed down to show the condition of husbandry at that period. The indirect assistance given by the Imperial Government to agriculture in Upper Canada, dates from a much earlier period than the encouragement given to agricultural societies by the Provincial Government; for we find among the donations of George III. to the U. E. Loyalists, the old English plough. It consisted of a small piece of iron fixed to the coulter, having the shape of the letter L, the shank of which went through the wooden beam, the foot forming the point, which was sharpened for use. One handle, and a plank split from a curved piece of timber, which did the duty of a mould-board, completed the rude implement. At that time the traces and leading lines were made of the bark of the elm or basswood, which was manufactured by the settlers into a strong rope. About the year 1808 the "hog plough" was imported from the United States; and in 1815, a plough with a cast-iron share and mould-board, all in one piece, was one of the first implements requiring more than ordinary skill, which was manufactured in the province. Since then great improvement has been made in the ploughs common throughout the country, and Bingham's Canadian plough, which is fine and light in its build, was favourably mentioned at Paris, in 1855.

The first public Act for the encouragement of agriculture in Canada, which came into operation in 1830, authorized the Governor to pay £100 to any district agricultural society which raised the sum of £50 by subscription, for the purpose of importing valuable live stock, grain, useful implements, &c. Several acts were passed in subsequent years, being modifications of that of 1830; all of them having for their object the encouragement of agricultural societies and agriculture. In 1847, an additional step was taken, fraught with very important consequences to the interests of husbandry in Canada, an Act for the incorporation of the Provincial Agricultural Association came into operation; and in 1850 Boards of Agriculture, for Upper and Lower Canada, were established by law. In 1851, an Act was passed to provide for the better organization of agricultural societies, and finally in 1852, the most important step was taken, when "an Act to provide for the establishment of a Bureau of Agriculture, and to amend and consolidate the laws relating to agriculture," came into operation. The district societies, which in 1830 drew their annual pittance from Government, and represented the agricultural interests of the colony, have thus grown, in twenty-two years, to a comprehensive and centralized organization, consisting of—first, the Bureau; secondly, the Boards of Agriculture for Upper and Lower Canada; thirdly, the Agricultural Associations for Upper and Lower Canada; fourthly, County Societies; fifthly, Township Societies.

In 1857, another change took place, being also a step in advance; an Act was passed "to make better provision

for the encouragement of agriculture, and also to provide for the promotion of mechanical science." The head of the Bureau of Agriculture, received the title of "Minister of Agriculture," with very extensive powers for obtaining and distributing information respecting the condition of husbandry, and the progress of arts and manufactures in the colony. By this Act, Boards of Art and Manufactures were created, and horticultural societies incorporated. The Boards of Agriculture distribute the annual Government grant to the county societies upon duly certified statements from the treasurers of the different societies. The progress of these excellent adjuncts to agricultural improvement is shown by the following comparative figures:—In 1852 there were twenty-two societies, which furnished 13,531 dollars, this amount being supplemented by 21,557 dollars Government grant. In 1859, sixty-one societies raised 24,221 dollars, and Government granted 32,836 dollars.

With the means at the disposal of the county societies, a valuable impulse has, no doubt, been given to agriculture in all its branches; chiefly by encouraging the introduction of a superior breed of animals, and of improved implements. Several societies have devoted a considerable portion of their funds to the importation of improved cattle and horses. The award of premiums for stock, implements, and farm productions generally, has encouraged private enterprise, and awakened a spirit of emulation, which has been most successful in promoting progress and improvement, and the rank which Upper Canada now occupies as an agricultural country is mainly due to the excellent organization and emulative spirit which has always distinguished the county societies since their first establishment.

As a necessary result of the successful working of the county and township agricultural societies, a growing desire began to be felt for the organization of a Provincial society, which would bring the farmers and manufacturers from all parts of the province together, and, by friendly rivalry and competition at an annual exhibition, present at one view the best results of the agricultural and mechanical industry of the colony. After several ineffectual attempts to obtain general and united action, a meeting of delegates from county societies was held at Hamilton, in August 1846, and the Provincial Agricultural Association and Board of Agriculture for Canada West formed. The first exhibition of the Association was held at Toronto in October 1846. The amount of prizes offered reached 1,600 dollars. In 1847, the Association was incorporated by an Act of Parliament, under the title of "The Agricultural Association of Upper Canada." Since that time it has increased in usefulness year by year. At the first Exhibition in 1846 there were but 1,150 entries, and £275 awarded as prizes. In 1860 there were 7,582 entries, and £3,235 awarded.

Permanent buildings are now erected at Toronto, Hamilton, London, and Kingston respectively, for the express purpose of holding annual exhibitions. In 1862 the annual meeting was held at Toronto, and permanent provision made for stabling 198 horses and 435 head of cattle; the amount of prizes offered exceeded 16,000 dollars. Such is the progress which has been made during fifteen years, in bringing together the different industries of Upper Canada, and teaching her people those lessons which can only be learned by friendly competition in an arena open to all, without distinction, prejudice, or

favour. The cause of this rapid improvement is, no doubt, in great part due to the immigration of scientific agriculturists, as well as practical farmers, who have learned and studied husbandry in all its branches in the best districts in England and Scotland. Any improvement which takes place, either in stock, implements, or farming practice, either in Europe or the United States, is immediately imported, and if satisfactory, adopted in Canada. By means of the different agricultural societies needful information respecting the results obtained are speedily made known, and there is now no lack of enterprising and energetic men, who gladly embrace every opportunity of improving their farming practice. The financial condition of the Association and the Board of Agriculture afford incontestable proofs of the deep root which these institutions have taken in Canada. In 1846 they commenced their operations without funds, relying solely on subscriptions. In 1859 the large sum of £22,2000 passed through the hands of the treasurer.

The subject of immigration is one of paramount importance to Canada. It was thought at the beginning of last year, that in consequence of the civil war raging in the United States an enormous increase of immigrants would arrive in Canada from different parts of the British Isles and Europe. This expectation has not been borne out; the total number of immigrants arrived at Quebec was 23,176 in 1862, against 19,923 in 1861. The tide has principally set to the Australian colonies, in consequence of the great exertions made by the various Legislatures and their agents, the assistance afforded in passage, and by grants of land, &c. This year nearly half a million sterling is available for expenditure on immigration purposes by the several Australian colonies. The efforts in Canada to induce immigration have been hitherto almost entirely, and very properly confined to the influx of the labouring classes, to whose unswerving toil and endurance is chiefly owing the great growth and prosperity of the colony; and it is deeply gratifying to learn how richly rewarded have been their labours. No county in the province

can be visited without finding thousands of families, who a few years ago entered the forest with the most limited means, but are now living under the happiest circumstances, in a position of perfect independence, possessed of beautiful farms, and surrounded by everything to grace and adorn life. One cannot but regard with admiration and astonishment the marvellous changes which have been effected within the last quarter of a century by the great industry and enterprise of the settlers. Who can traverse at the present day the settled pastures of the vast and fertile territory extending along the valley of the St. Lawrence, with its endless tributaries, and those great inland waters, which along with the complete railway system afford to the most remote settlements unparalleled facilities for trade, without feeling that Canada still presents an unlimited field for enterprise? When we regard the national advantages of its geographical position, the capability of the territory to sustain a population at least fourfold what it is at present, the rapid introduction of improved systems of husbandry, the general state and well-being of the agricultural population, and the consequent increase of colonial wealth, we may fairly say that Canada now presents attractions of no ordinary character, not only to agricultural labourers and mechanics, but also to men of moderate capital.

Many men in Europe, who have no definite profession or pursuit, are living with little satisfaction upon the small rate of interest they receive from a capital of from £1,000 to £10,000, whereas in Canada, with ordinary prudence and enterprise they would soon secure to themselves and their families a position far more independent and satisfactory. If their predilections lead them to choose commercial and industrial life, ample rewards await them; and if they give preference to agricultural pursuits, they can easily find beautiful and fertile localities, which they can obtain upon easy terms—farms near railway stations, already planted with the choicest fruits, and in such a condition of advancement as at once to secure to them the comforts of life in their greatest abundance.

CAN STEAM CULTIVATION BE GENERALLY ADOPTED?

BY A PRACTICAL FARMER.

There can no longer remain a doubt upon any intelligent farmer's mind that the profitable cultivation of land by the aid of steam has become an established fact. On all heavy clay and stiff lands it constitutes the greatest improvement of modern times. No horse-power, however quietly and steadily the team may draw, or simultaneously exert their strength, can at all compare with it. The big Iron Horse, standing firm and confident on the headland, commencing his strong pull with his usual puff and snort, drags his somewhat ponderous and powerful implement irresistibly through the soil at such great depth and surprising precision as no horse implement ever attained to. Seasons are subjected to its power; be the land never so hard the powerful steam implement will break it up—be it so wet as to prevent trampling, the steam horse can work. He never tires. He can get through the work just at the right time. Is it harvest?—Only clear him a way, and he will, with but two or three hands, presently break up all the arable lands as they are cleared, so as to prepare them for the new era dawning upon British agriculture, *i. e.*, the latter growth of roots and cereals for spring feeding. Is it seed-time?—How quickly he prepares the soil for the seeding just at the time needed! Is it following time?—See with what power and readiness he turns over and pulverizes large fields, and how well he can expose the

rough fallows to atmospheric influences, turning the big clouds over and over in a way that would have delighted our great grand-sires. He is also a complete master of subsoil drainage, subsoil ploughing, trench ploughing, and almost any other hard labour to which you may apply him, provided you give him proper implements and tools to work with. And what is also his greatest recommendation, he can and does do all this at a far cheaper rate than it can be done (if it was possible to do it) by cart-horse power. This is proved by numerous facts, as related by many of his trustworthy employers.

Seeing then that this is the fact, and that cultivation by steam power is so beneficial, how is it that it has not become more generally adopted? The question is easily answered. It is owing to the great cost of the steam engine, the implements, and the apparatus necessary to complete a "set of steam tackle." None but our landed gentry or our opulent farmers can afford the outlay. The price of an effective and complete "set of steam tackle" of sufficient power for medium soils would exceed £800, and for stiff and adhesive lands would reach nearly £1000. This, every farmer will say, is a serious expenditure, and but few comparatively are prepared to expend it. It is true, neighbours might combine and purchase a set for their especial use, or to do their heaviest work; but this mode

has its inconveniences. Each party desires to work it at "the right time"—the same time; all men have not the same ideas of its uses; one works it harder than another; the soils vary; the farms vary; there is a difficulty in estimating what each should contribute to the purchase and repairs; and the custody and management must rest with some one. It is far better to be independent, or to hire the use of one, than to join in partnership. It might be that persons would purchase sets for the purpose of letting out to hire; but the price almost forbids that. A man having command of £1000 would hesitate to lay it out in such way so as to be subject to the chances of work and the caprices of his neighbours. Limited companies might be got up for the like purpose in various districts, and subscriptions entered into, to buy sets suited to their respective districts; but there is all the machinery of management and proportionate expense attached to these small companies as to larger ones, and seldom will they be so well looked after. Few of them can be large enough to employ special officers to attend to their interests—hence failures would ensue. All matters connected with explosive steam must be closely and effectually watched, for which purpose competent men must be employed, who, of course, require remuneration according to talent and extent of business. The manufacturers of steam machinery and implements cannot be expected to give much aid to needy farmers. Generally speaking, "the goings out and comings in" have often enough to do to keep even with each other; hence extraordinary credit cannot be thought of, in aid of steam cultivation. Landlords, it is said, ought to take such an important matter up, and ultimately, as for their own sakes, to give their best aid to promote this mode of cultivation amongst their tenants. But this course has its difficulties. Tenants have no objection in accepting any kindness cordially offered them by a landlord; but if he has to buy them an expensive implement, and charge them for the use of it, there would soon be a demur as to its value and usefulness; and I am afraid many suspicions (groundless though I believe them to be) would arise as to the general issue; i. e., if the landlord finds the produce enhanced by steam cultivation, that he would require more rent—and I am not going to say he is not entitled to it: on the contrary, if a landlord finds means to make his land more valuable to his tenant, he is entitled to an advantage by doing it. There is nothing unfair in this, but it is substantially right. But it is quite otherwise if the tenant through his enterprise and talent achieves great things. The landlord cannot in justice take advantage of his tenant's success. It is therefore best that the tenant shall be independent of his landlord in this respect. Should the tenant, as he undoubtedly would, require greater privileges in management and cropping, &c., then he must give an equivalent for it to the landlord. This is fair as between both parties, and thus the landlord is benefited.

Another course to promote steam cultivation would be,

by the establishment of a public company for this purpose. This is now the universal mode of accomplishing every great work, and steam culture for the kingdom is a great work indeed, and will require ample funds to achieve it. It will ere long gradually make its way independently, because the great results shown will suffice to make it popular and attractive. Every occupier will seek its introduction upon his own farm; the great hindrance in by far the majority of cases being inability to cope with the heavy outlay. Well, then, let us have a public company of sufficient capacity to cope with every difficulty. Let it be upon the mutual assurance principle, so that every occupier of land may be induced to become a shareholder, and in this way contribute to promote the speedy extension of steam culture throughout the country. It is thus that greater interest will be excited. The farmers in every district will have the means of steam culture placed within their reach; and it will be their own fault, as its benefits become more widely known, if they do not adopt it.

The getting up and subsequent management of such a company are not attended with any unusual difficulty. Public companies are in being everywhere, and present models in abundance for adaptation and guidance to the promoters of such a company as I suggest, i. e., "The Agricultural Steam Appliance and Farmers' Assurance Company." The shares should not be large in amount, and the terms of aid granted to applicants should be liberal. The company should undertake to provide steam apparatus for every applicant, upon a sufficient guarantee for payment in a given time; a part to be paid down, and the balance by instalments to be regulated by the company. The whole apparatus to remain the property of the company till all is paid for, and to be kept in good order and repair by the purchaser till such amount is paid. This would, of course, lead to close attention on the part of the purchaser. I use the word *apparatus* because I do not wish to confine the operations of the company to steam culture exclusively. There are many serviceable ways in which a needy farmer may be aided—in works of drainage—in farm buildings—in expensive manurings—in costly implements, i. e., as steam-threshing machines, &c., &c.; in fact, to provide him funds, if desirable, for all his necessary and profitable expenditure, subject to the control and direction of the company. I am well aware that for all this, an extensive organization and a staff of well-selected officials in whom the country has confidence will be requisite to carry all out in its efficiency; but the object is worthy the effort. I am bold enough to affirm that the farming community will generally and gladly respond to the movement; rejoicing that such great advantages are placed within their reach; and further, that in the majority of cases, the costs of the whole cultivating apparatus may be defrayed out of the profits arising, before the term of loan expires, extending as it should over some seven years or more, according to agreement, in each case.

THE SUFFOLK AGRICULTURAL ASSOCIATION.

MEETING AT IPSWICH.

A striking and very significant change has gradually taken place in the occupation and amusements of a country life. Going back some twenty years or so, had a race-meeting been held in the county-town of Suffolk in one week and a cattle-show in the next, the probability is that everybody would have been at the races and hardly anybody at the show. It certainly sounds like a whole new fact to be able to say that the very reverse of this

state of things is now the case. Nobody would seem to care about the running horses, as everybody to be interested in the stock classes. There is scarcely the carriage of a county family to be seen on the course, and, but for the presence of a few "legs" from London, and jockeys from Newmarket, the good old town of Ipswich would offer but little evidence as to there being anything going on. Whereas, for a day or two before the agricultural ex-

hibition, the whole place is in lively preparation; beds are scarce, and authentic information is received that the Lord Lieutenant and other influential personages are coming down; that the entries are better than ever, and that in every way the show is sure to be a good one. A very noticeable feature, moreover, is, that sportsmen, hunting-men, and "horsey"-men, who would not turn a mile out of their road to see the finish for her Majesty's guineas, fairly desert their meadow-haymaking and strawberries-and-cream, to watch the judges at work over the riding-horse classes. And even further than this, we really believe that the farmer himself thinks more of taking a first prize than ever his father did of winning the Yeomanry Plate; while his good wife, what with the flower-show in the Arboretum and the pleasant gossiping day with so many old friends, comes to like the one meeting as much as ever she dreaded the other.

Still, in Suffolk more especially, there is no denying but that these horses have a deal to do with the popularity of the occasion; and yet it is but some twelve or fourteen years since that the light-horse section of the show was abandoned, for one year at least, as not coming properly within the scope of an agricultural gathering! However, the nags have only taken stronger ground since this passing alight, and now they clearly contend, with the mighty chestnuts, for the first honours of the day. It was a nice point between them on Friday, when the committee of the association could honestly congratulate themselves on the best general entry they have yet been able to command. Not only were the horses of either class excellent, but the polled beasts were found to be improving, the shorthorns as high-bred as ever, and the pigs, almost one and all, quite marvellous for their merits. If the sheep show was not so "even," there was still not a variety but that was becomingly represented, whether we turned to the Norfolk long-wools, to Southdowns full of Babraham blood, or to the Suffolk black-faces, which still have their supporters, say what the rest of the world may about their capabilities for producing prime mutton or much wool. But one can only take such kind of cattle in turn after a long spell by the side of either of those two famous horse-rings for which Christchurch Park is still unequalled. The test of the show, after all, centred here, and the Suffolk carters well maintained their right to that order of precedence which the catalogue allows them. Not only were the old horses commendable, but there was still more promise observable amongst the younger animals, which, from the judicious use of two or three favourite stallions, are fast growing out of some of those queer points once held to be so necessary to the orthodox appearance of a true Punch. Prominent, of course, amongst these fashionable sires, still stands the famous Chester Emperor, as handsome, as fresh, and as invincible as ever. Here, quite in his own ground—for he was born within a mile of the Park—he won another cup, as the best cart-stallion of any age, with sundry concomitant premiums attached, and Conqueror once more as only a fair second against him; while May-Duke, Raglan, Stearn's Boxer and Champion—all good winners in their time—were in the field behind Mr. Badham's horse. They were almost all, too, in good form; and we did not hear of Mr. Barrow, the veterinary inspector, being anything like so busy as was Professor Simonds, at Witham, last week. Nevertheless, if the Suffolk horses do go wrong, it must be mainly from their not getting fair-play of their owners, many of whom persist in so loading their stock with flesh as to become rather unsightly than attractive, the more particularly when set going. Let us take, for instance, Mr. Tomlin's otherwise clever filly, a Royal winner at Battersea, and the best three-year old at Ipswich. With a fine expressive head, great substance, and good points, this mare was so overdone that she could not walk, but

merely waddled; and she would have shown a deal better simply if shown a deal lighter. Either for breeding or working, Darby was unnaturally high in flesh or fat, and the breed must have indeed extraordinary properties, to bear up for long against this aldermanic ordeal of stuffing and guzzling, for the good of the constitution. There were many other entries almost equally open to the same objection, but we take this fine filly as a strong illustration of an ambition that has overleapt itself, and as having won in the face of great difficulties, from not being in a fair condition to show. If action has anything to do with the merits of a horse—as we suppose it has, for either draught or saddle—the judges must have looked, with some determination of purpose, all the other way when they instructed the gentle public to seek, like a second Sinbad, for the golden nuggets in such an inanimate lump of flesh. We do not see why a Suffolk horse should not be passed by when over-fed as well as a Shorthorn cow. Mr. Tomlin's filly was backed by another daughter of The Hero, taking a deal after him, and with as much of the character of what a Suffolk should be as anything in the entry—smart, cheerful, and compact, with weight without lumber, and width without awkwardness. In the companion class of three-year-old colts, Mr. Mumford's good-looking Young Emperor changed places with Mr. Cottingham's useful horse, but with Mr. Frost now separating them with another son of The Hero for second place. In fact, The Emperor, Hero, and Pilgrim threaten to carry all before them; and though Mr. Barthropp stood aside when anything actually bred by himself came in, he must have recognized a deal of the Crettingham blood at one time or another in the ring where he officiated. The best two-year-old, however, was another Young Emperor, that, for appearance, size, substance, and action, has all the promise of making a good horse, as Mr. Rist knows, when he opens his mouth to put him in price. Mr. Mumford had to replace the Yarmouth two-year-old with another here, as the former knocked himself terribly about in the train, and, as if conscious of his weak place, so contrived that his "pony head" should swell up to twice its natural size. The Witham prize yearling was again first; but Mr. Hodgson and Mr. King alike expressed their anxiety to meet him again, not regarding Mr. Giles' colt as quite the wonder he has been about home. The Judges, indeed, considered the three but indifferent, and it was only with some reluctance that they awarded the prizes in this class. Mr. Hodgson was also second with his two-year-old filly, by Hero, out of Smart, well bred enough for anything—except standing alongside the Mersea Jewel, with her neat head, rare ribs, great thighs, and merit "all over." A fine level daughter of The Pilgrim was the best yearling; and the best foal, also from the Dennington stud, was by Pilgrim, as was the second best, by the side of Old Smart; so that if Mr. Biddell will not show the Canterbury horse, he can show a deal for him—a fact that may come to much the same thing, although we should like to see our old favourite once more upon parade. The Charsfield mare, despite her own "first," just lost the cup again, as she did last year at Bury, the award for the best of all the mares and fillies going in favour of Mr. Wolton's handsome and fresh-looking old Moggy, who had rather the pull over Smart as far as mere show went, from having had no foal this season, but being early stunted on; while Mr. Parson put his stylish Halstead mare into the extra-stock, where, of course, she commanded some official notice, though we did not hear whether she was brought out for the Ipswich Cup. Sir Edward Kerrison's second-prize brood-mare Bragg better known perhaps as Mr. Wrineh's, is still a wonderfully grand one; while Sir Thomas Beauchamp is equally commendable for another, best distinguished as "Gleed's mare;" and, in fact, the class was so excellent that Matchet walked in and out again without even a

note of admiration to speak to her presence in such fine company. If not quite so successful as of late, Mr. Crisp was able to match his second horse with a second prizemare, one with plenty of size and a deal of quality, which he bought at Mr. Barthropp's sale, and that consequently left her placing in the hands of Messrs. Goodwyn and Green, gentlemen almost equally well read up in the old blood of the county. It was very satisfactory, however, to see how straight the trio went; and if they could only have got over their taste for blubber, we really do not think that we should have a word to offer against their decrees. And that is saying something, too!

The other set of judges had by no means an idle morning of it, what with thorough-bred stallions for hunting purposes, thorough-bred stallions for coaching purposes—a distinction, as we take it, without a difference—stallions for coaching purposes not thorough-bred, cob stallions, and no end of classes of mares, foals, and young stock. Still, the pure-bred ones did not muster in any force; and the absence of a representative of the Hasketon interest was much felt. Old Dr. Sangrado had only Tom to beat, and the ring-bony feet of the latter of course put him out, although we believe that Mr. Crisp goes about with a veterinary surgeon's certificate in his pocket to the effect that his handsome horse has nothing of the sort! The terribly high-bred Vir, or Dutchman, was again the best coach-horse—and at the same time, we should have said, “the best riding-stallion,” as the conditions of the Town Cup worded it. But the judges pronounced this to be a chestnut cob of Mr. Webster's, looking a deal more like leather, with his bad Suffolk head, indifferent shoulders, and but little of the “riding horse” in his action. Mr. Crisp's good subetantal son of The Lion was more in his place, as his chief drawbacks were his rather coarse head and neck, which the winkers and collar would go to hide in any of his stock that may take after him in these respects. Mr. Boby sent a couple of very clever brood-mares: one, as it struck us, rather out of her place as a machiner, and both with foals by Oulston—the winner a wonderfully promising filly, and almost as full of quality as that famous horse himself. The coaching horses made up a very fair class, and Mr. Cooper's capital roomy old mare had a very clever foal, trimmed and fashioned up in the most amusing style, though quite good enough not to need all this early cutting and curling. None of the two and three year old classes were remarkable either for numbers or merits, though Mr. Hubbard's roan hack mare, small and plain as she is, had the recommendation of fair action—a point, however, in which many of the others signally failed. Not one of the ponies could move, and Mr. Branwhite's long, low, and level to stand by, destroyed the first impression directly you had her out. His hackney gelding, on the contrary, is all over a good one, in or out. With something more of the gentleman about him in his nice head and “quality look,” than hacks in general often own to, he is a very fine, showy goer, and, if there had been any Cup for “the best hack,” as the offer should have been, he must have won it. None of these classes, however, attracted so much attention as the hunting mares or geldings, and none of these so much as Mr. G. M. Sexton's immense brown horse, quite up to seventeen stone, and said to be able to go a-pace with hounds. But he is as plain as a pikestaff all over, though bound to make money in the market, and a nag, we should fancy, after Mr. Spooner's own heart. Still a Revenge horse of Mr. Mumford's, with some liberty about him, and more quality, but by no means a beauty, beat the big'un for first, the loaded point of the chestnut mare's shoulder only stopping her from something more than a commendation. In other respects, with her good hocks and thighs, fashion and substance, she was the pick of the lot. This mare now goes

from Mr. Grout, who was second with her at Yarmouth, to that good judge, Mr. Allen Ransome, who showed, as extra stock, the most perfect Shetland pony that ever was made a spoilt child of. But King Pepin was only a wonder for his inches, and the old Yore, now stinted to Oulston, had the first claim for the extra prize money.

In the cattle classes this extra stock was by no means so easily disposed of, and the award of the Cup for the best bull of any age was regarded as the great mistake of the day. Conspicuous amongst these extras Mr. Crisp sent the renowned Battersea Gamester, a bull that has gone on wonderfully well since then, and that for length, style, and quality is now a very grand animal. But the judges maintained that they saw his superior in a yearling, the property of Major Parker, a young bull certainly in only fair working condition, but scarcely in any other respect to compare with the Yorkshireman. The charitable conclusion, as at first arrived at, was that the white bull had never been taken out for the Cup, although we believe he was officially pronounced to have been beaten on his merits. The Cup for the best cow or heifer was another apple of discord, the public pretty commonly preferring the style and quality of Princess of Edward to the good beef of Violet. Unfortunately the entry of the Pride of Southwicke arrived a few hours too late, or the Cup would unquestionably have gone to Branches, where her Ladyship is still holding back her hand for Worcester, so that we must not test her strength by any such merely useful animal as the Lady of Bonhill. Mr. Crisp's other white bull was second the other day at Yarmouth, and Mr. Harvey's, which gave way to the Cup winner, a first in Norfolk; that frightful example Pan, or “Dan,” as they now call him, braving further criticism, though now well known enough to be passed over, as he was by the judges. The red polled cattle, with many Battersea beasts amongst them, made up a much more even show than usual, if not yet quite up to the quality of the Norfolk herds; and, like the Norfolk, the Suffolk cows are clearly again on the improvement.

Of the sheep and pigs we have already made some mention, but it may be as well to add that Mr. Brown's longwools were placed again precisely as they were at Yarmouth, and that his champion shearing there was also the Cup winner, although not without Mr. Heath being called to decide the point between him and the older ram from the same flock. Sir Thomas Lennard's best ram was his Babraham tup, but the judges complained of the size of his shearlings, and went to other parts for their first; the companion cup, however, going to one of Mr. Brown's ewes, which, “of their sort,” were no doubt the best sheep in the show. One class of the pigs was commended; and if they had only thought of it, Messrs. Rigden and Sturgeon might have commended the swine generally, as they admitted that they had seldom seen so thoroughly a good lot, with the blacks still for preference.

Although the steam horse was jealously prancing about amongst the Suffolks, the great implement makers of these parts have set their faces against any invidious notice either from the judges or others, and we have consequently only to add that the following firms, put literally somewhat in the shade, made up a worthy show of approved machinery:—Boby, Bury St. Edmund's; Bone, Ufford; Bradford, Manchester; Burrell, Thetford; Crosskill, Beverley; Cooper, Ipswich; Dodge, Dowgate Hill; Fison, Stowmarket; Garrett, Leiston; Hammond, Gorleston; Harwood, London; Hunt, Earl's Colne; King, Ipswich; Maynard, Whittleford; Meadows, Ipswich; Mildenhall Company; Page and Girling, Woodbridge; Rands, Ipswich; Ransomes and Sims, Ipswich; Smith, Swebbing; Smith, Ipswich; Smyth and Sons, Peasenhall; Syer, Hadleigh; Turner, Ipswich; Walcot, Islington; Ward and Silver, Melford; Warren, Maldon; Woods and

Cocksedge, Stowmarket; Wrinch, Ipswich. Agar's digger was at work in a field on the other side of the park, and the Ransomes' had some machinery "in motion" on the ahow ground.

PRIZE LIST.

HORSES FOR AGRICULTURAL PURPOSES.

JUDGES.—N. G. Barthropp, Hacheston, Suffolk.
S. C. Goodwyn, Covehithe, Suffolk.
E. Green, Bury St. Edmunds.

Cart Stallions having served not less than 20 Mares in the County.

Ipswich prize cup of £15 as best of all the cart stallions, first prize of £10, and prize of £5 as breeder, to G. D. Badham, Bulmer Tye (Chester Emperor); second of £5 to T. Crisp, Butley Abbey (Conqueror).

Highly commended.—T. Crisp (May Duke); T. Smith, Hasketon (Raglan).

Three-year-old Entire Cart Colts.

First prize of £8 to E. Cottingham, Dunningworth Hall (Talbot); second of £5 to C. Frost, Witherstead; third of £4 to M. Mumford, Creeting (Young Emperor).

Highly commended.—W. Wilson, Baylham Hall (Nonpareil).

Two-year-old Entire Cart Colts.

First prize of £8 to J. Rist, Tattingstone (Young Emperor); second of £4 to M. Mumford, Creeting (Young Duke); third of £3 to W. Wilson, Baylham Hall.

Highly commended.—J. M. Dawson, Bucklesham.

Yearling Entire Cart Colts.

First prize of £5 to H. Giles, jun., Great Clacton; second of £3 to E. G. Hodgson, Charsfield Hall.

Cart Mares.

First prize of £6 to E. G. Hodgson, Charsfield Hall (Smart); second of £4 to Sir E. C. Kerrison (Bragg).

Highly commended.—Executors of the late T. Capon, Dennington (Diamond), and Sir T. Beauchamp, Langley Hall, Norfolk (Smart).

Commended.—R. H. Wrinch, Harkstead (Ruby), and R. Welton, Marlesford.

Cart Foals.

First prize of £6 to the Executors of the late T. Capon (by Pilgrim); second of £4 to E. G. Hodgson (by Pilgrim).

Gast Mares.

Ipswich prize cup of £15 as best cart mare, and first prize of £8 to S. Wolton, sen., Newbourne Hall (Maggy); second of £4 to T. Crisp.

Highly commended.—A. Freur, Debenham (Scott).

Commended.—A. Freur (Depper).

Three-year-old Cart Fillies.

First prize of £8 to G. Tomline, M.P. (Darby); second of £4 to S. Wolton, sen (Bonny).

Two-year-old Cart Fillies.

First prize of £5 to J. Warn, East Mersea (Jewell); second of £3 to E. G. Hodgson.

Yearling Cart Fillies.

First prize of £4 to the executors of the late T. Capon; second prize of £3 to W. Gardon, Brantham (Grace).

Commended.—G. Tomline, M.P.

Three-year-old Cart Geldings.

No Merit.

Four-year-old Cart Geldings.

No Merit.

Cart Geldings of any age.

Prize of £4 to W. Gardon.

HORSES FOR RIDING AND COACHING PURPOSES.

JUDGES.—J. B. Blake, Thurston, Suffolk.

Capt. Haward, Bramford, Suffolk.

W. C. Spooner, Ring House, Southampton.

Thorough-bred Stallions for Hunting Purposes, having served not less than 10 Mares in the County.

First prize of £10 to H. Westropp, Long Melford (Doctor Sangrado).

Thorough-bred Stallions for Coaching Purposes, having served not less than 10 Mares in the County.

Prize of £10 to G. Dobito, Lidgate (Datchman).

Stallions not thorough-bred for Coaching Purposes, having served not less than 10 Mares in the County.

Prize of £10 to T. Crisp.

Cob Stallions, not thorough-bred.

Ipswich prize cup of the value of £15, as best riding stallion, and prize of £5, to E. Webster, Framden (Sweetheart).

Highly commended.—J. Hare, Shotley (Gay Lad).

Riding Mares.

Ipswich prize cup of £10 to T. Crisp (The Yore).

Hunting Mares with Foals at foot.

Prize of £5 to C. Boby, Stutton (Alma).

Highly commended.—M. Mumford, Creeting.

Commended.—J. G. Shepherd, Campsey Ashe.

Coaching Mares with Foals at foot.

Prize of £5 to G. Gooderham, jun., Monewdon.

Commended.—H. Biddell, Playford, C. Boby, Stutton, and R. Cooke, Livermere.

Cob Mares, with or without Foals at foot, covered or not covered, not thorough-bred.

Prize of £5 to Major Parker, M.P., Clopton Hall.

Hunting Foals.

Prize of £5 to M. Mumford, Creeting (by Mentmore).

Commended.—H. Biddell and R. Cook.

Coaching Foals.

Prize of £4 to G. Kerr, Tanstell (by Howden).

Roadster Foals.

Prize of £4 to R. J. Cooper, Blythborough (by Billy Barlow).

Foals by thorough-bred horses.

Prize of £4 to C. Boby (by Oulston).

Three-year-old weight-carrying Mares or Geldings for Hunting purposes.

Prize of £4 to H. Westropp, Long Melford (Sutton).

Three-year-old Mares or Geldings for Coaching Purposes.

No merit.

Three-year-old Roadster Mares or Geldings.

Prize of £4 to N. Scott, Haxna.

Highly commended for hunting purposes, J. Hare, Shotley (Silver Tail).

Two-year-old Mares or Geldings for Hunting Purposes.

Prize withheld, on the ground that the best was not equal to carry weight.

Two-year-old Mares or Geldings for Coaching Purposes.

Prize of £4 to W. Welton, Bradfield.

Two-year-old Roadster Mares or Geldings.

Prize of £4 to J. Hubbard, Hunston.

Highly commended.—M. Biddell, Playford.

Hackney Mares or Geldings, under seven years old.

First prize of £5 to F. Branwhite, Melford (Quicksilver); second of £3 to J. Groat, Woodbridge.

Commended.—E. Greene, Bury St. Edmunds.

Ponies, not exceeding 13½ hands.

First prize of £5 to J. Branwhite (Pretty Lam); second of £1 to R. Garrett, Carlton Hall.

Highly commended.—T. Crisp.

Commended.—E. H. Woods, Walton, and T. Crisp.

Hunting Mares or Geldings, not exceeding seven years old, by a thorough-bred horse.

First prize of £5 to M. Mumford, Creeting (Jim Crow); second of £3 to G. M. Sexton, Witherstead.

Commended.—J. Groat, Woodbridge, and B. P. Greene, Blakenham.

CATTLE.

JUDGES.—W. Dodds, Keeby, Lincolnshire.

W. Heath, Ludham, Norfolk.

Suffolk Bulls, not under two years old.

First prize of £6 to S. Wolton, sen., Newbourne Hall

(Battersea Belipse); second of £3 to J. G. Shephard, Campsey Ash.

Suffolk Bulls, under two years old.

First prize of £4 to S. Wolton (Duke of Suffolk); second of £2 to Sir E. C. Kerrison (Marquis).

Bulls of any other breed, not under two years old.

First prize of £4 to T. Crisp (Shorthorn, Abbot); second of £2 to Major Parker, M.P. (Shorthorn).

Commended.—Sir E. C. Kerrison (Shorthorn, Brave Hero).

Bulls of any of other breed, under two years old.

Ipswich Prize Cup, as best of all the bulls, and first prize of £4, to Major Parker, M.P.; second of £2 to W. Harvey, Taverth (Cockatoo).

Suffolk Cows, in milk or in calf.

First prize of £5 to S. Wolton (Cowslip); second of £3 to Sir E. C. Kerrison (Duchess of Suffolk).

Commended.—Sir E. C. Kerrison (Duchess of Norfolk).

Three-year-old Suffolk Heifers, in milk or in calf.

First prize of £4 to S. Wolton (Battersea Favourite); second of £2 to Sir E. C. Kerrison (Susan).

Commended.—M. Biddell, and Sir E. C. Kerrison (Cossett).

Two-year-old Suffolk Heifers, in milk or in calf.

First prize of £4 to Sir E. C. Kerrison (Isabella); second of £2 to G. Tomline, M.P.

Highly commended.—A. W. Crisp, Chilleshford.

Commended.—A. W. Crisp.

One-year-old Suffolk Heifers.

First and second prizes of £3 and £1 to G. Tomline.

Cows of any other breed, in calf or in milk.

First prize of £5 to Lady Pigot, Branches Park, Newmarket (Southern, Lady of Beahill); second of £3 to T. Crisp (Southern, Maria).

Commended.—T. Crisp (Shorthorn, Marian).

Three-year-old heifers of any other breed, in milk or in calf.

Prize of £4 to T. Smith, Little Bealings; second of £2 not awarded.

Two-year-old Heifers of any other breed, in milk or in calf.

The Ipswich Prize Cup of £7, as best cow or heifer, and first prize of £4, to Sir E. C. Kerrison (Shorthorn, Violet 3rd); second of £3 to Lady Pigot (Shorthorn, Princess of Edward).

One-year-old Heifers of any other breed.

First prize of £3 to Lady Pigot (Shorthorn, Lady Edburga); second of £1 to M. Mumford.

Commended.—M. Mumford.

Fat Oxen not exceeding three years old.

Prize of £3 to Sir E. C. Kerrison.

Fat Heifers, not exceeding three years old.

Prize of £2 to A. W. Crisp.

SHEEP AND SWINE.

Judges.—W. Rigden, Hove Farm, Brighton.

D. Sturgeon, South Ockendon.

Southdown Tup of any age.

Prize of £6 to Sir T. B. Lennard, Balhoe.

Shearling Southdown Tup.

Prize of £6 to G. Tomline, M.P.; second of £3 to Sir T. B. Lennard.

Tup of any age of the Black-faced breed, now named "the Suffolk."

Prize of £5 to G. Dobito, Lidgate.

Shearling Tup of any age of the same breed.

First prize of £6 to G. Dobito, Lidgate; second of £2 to J. M. Green, Stradishall.

Long-woolled Tup of any age.

Prize of £6 to T. Brown, Marham.

Specialty commended.—T. Brown (for another tup).

Shearling Long-woolled Tup of any age.

Ipswich Prize Cup of £7 and the first prize of £6 to T. Brown; second of £3 to T. Brown.

Highly commended.—H. Aylmer, West Dereham.

Southdown Shearling Ewes.

Prize of £6 to G. Tomline, M.P.; second of £3 to Sir T. B. Lennard.

Shearling Suffolk Ewes.

First prize of £6 to W. Harvey; second of £2 to P. H. Frere, Dungate.

Long-woolled Shearling Ewes.

The Ipswich Cup, of the value of £7, for one best ewe, and the first prize of £6, to T. Brown; second of £2 to H. Aylmer.

Short-woolled Shearling Wethers.

Prize of £3 to Sir T. B. Lennard.

Long-woolled Shearling Wethers.

Prize of £3 to J. Rand, Hadleigh.

Wether Lambs of any breed.

First prize of £4 to H. Cotton, Amor Hall; second of £2 to H. M. Day, Langham.

Ewe Lambs of any breed.

First prize of £4 to T. H. Frere, Dungate; second of £2 to H. Cotton.

Boars of the Black Breed.

The Ipswich Cup of £7, as best boar, and first prize of £5, to T. Crisp; second of £3 to T. Crisp.

Highly commended.—G. M. Sexton.

Commended.—G. M. Sexton.

Boars of the White Breed.

First prize of £5 to T. Crisp; second of £3 to G. M. Sexton.

Sows and Pigs of the Black Breed, the Pigs not exceeding twelve weeks old.

First prize of £4 to S. G. Stearn, Brandeston; second of £3 to S. Wolton, jun., Keagrove (Blackmoor).

Sows and Pigs of the White Breed, same conditions.

First prize of £4 to S. G. Stearn (Victoria); second of £3 to Sir T. B. Lennard.

Highly commended.—S. G. Stearn.

Breeding Sows.

The Ipswich Prize Cup of £7, as the best sow, and first prize of £3, to T. Crisp; second of £2 to G. M. Sexton.

Highly commended.—T. Crisp and Sir E. C. Kerrison (Annie Laurie).

The class commended.

Young Sows pigged Nov. 1.

First and second prizes of £3 and £2 to G. M. Sexton. Extra Stock.

Prize of £4 to T. Crisp, for brood mare (The Yore); £4 to T. Crisp for shorthorn bull (Gamester); £3 to W. Parson, for Suffolk cart-mare; £2 to J. Great, for brown cob; £1 to B. J. H. Harvey, for riding-horse.

C H E E S E.

Judge.—S. Wainwright, Ipswich.

Suffolk Cheeses.

First prize of £3 to J. Ebdon, Nessingfield; second of £2 to R. Tricker.

THE DINNER.

The scene of this entertainment was, as usual, the Corn Exchange. The Earl of Stradbroke presided, supported by the Duke of Grafton, Lord Henauker, M.P., Sir E. C. Kerrison, M.P., Earl Jermyn, M.P., Col. Adair, Mr. J. C. Cobbeld, M.P., the mayor of Ipswich (Mr. G. C. E. Bacon), the mayor of Great Yarmouth (Mr. R. Steward), Major Parker, M.P., Mr. A. Arcedeckne, Mr. R. J. H. Harvey, &c. The vice-chair was occupied by the Marquis of Bristol, who had right and left Sir C. J. F. Bunbury, Sir C. Rowley, Lieut.-Col. Amstruther, and Mr. Hambersten, M.P. As regards the general company, provision was made for scarcely so large a number as usual, and even then all the seats were by no means filled. One singular feature in the decoration of the hall was the presence of two large paintings styled "blood and bone." "Blood," representing a choice riding horse, was a passable

work of art; but "bone" was a comparative caricature—the landscape, in which an over clumsy cart-horse was disporting himself, being dwarfed in a ludicrous manner.

After several loyal and patriotic toasts,

The Duke of GRAFTON, who had to leave for London, in common with the Marquis of Bristol, Earl Jermyns, and Sir E. C. Kerrison, proposed the health of the noble chairman, and success to the society.

The CHAIRMAN, in responding, said: In the natural course of events, the chair must soon pass into other hands; but, surrounded as he was by so many of the best and most illustrious families of the county, he was sure the society would experience no difficulty in finding a successor. In taking a short and cursory review of the society from its commencement, he was happy to say that it had increased in numbers and in popularity, and he hoped he might also add that an improvement had taken place in the cultivation of the soil since it first met in 1831. That improvement had perhaps been slow, but it had been sure—sure, because the society comprised many active, intelligent, and zealous members determined to adopt every new system which was likely to answer; slow, because, like all other trades, farming was subject to the influences of untoward events. He well remembered, in 1831 or 1832, alluding slightly to the fact that steam power would have a great effect on agriculture generally; but when the remark was made, steam ploughing was considered altogether visionary. He was now, however, in a position to state that steam ploughing was gradually acquiring a greater application to the soil. Two personal friends of his own had purchased steam ploughs, and were satisfied with the progress which they had made. One farmed seven hundred acres of heavy land in the county of Leicester, of which five hundred acres were arable, and so well satisfied was he with the new system, that he had reduced the number of his cart horses from twenty-four to twelve. Machinery was but of little value unless it tended to reduce the expense of cultivation, and this point must be kept steadily in view. The next matter upon which he would touch was the great necessity of paying every possible attention to the breeding of stock. He was sure every one who had attended the show during the day must have been gratified in witnessing the great improvement which had taken place, for he never recollected so good a show on former occasions. He alluded to this more particularly, because it was possible that wheat might be sold at 40s. per qr. during the coming autumn, and it was by the improvement of their stock that the farmers could alone keep their heads above water. In the midst of these difficulties he saw one bright speck of sunshine in the distance. He hoped that when the Suffolk Agricultural College was built, the result of it would be that the improved scientific education available would enable farmers to compete more advantageously with all the great corn-growing districts of the world (Hear, hear.) His lordship then proposed "The County Members," remarking on the fact that by his continued exertions, Sir F. Kelly had succeeded in obtaining a committee to investigate the subject of the malt tax (cheers.)

Lord HENNIKER, M.P., made a hurried response to the toast, having, as he said, "to run for it" to catch the up-train for town. The noble lord stated that Sir F. Kelly was desirous of receiving the names of any gentlemen who wished to be examined before the Malt-tax Committee. Reverting to the past, the noble lord added that he remembered with Lord Stradbroke the time when steam cultivation was ridiculed, and pronounced utterly impracticable. The same state of things prevailed with regard to gas; for he recollected that Lord Eldon argued that the proposed new mode of lighting

would do away with the nursery for seamen, inasmuch as the Greenland fishery would be destroyed by it (laughter.)

Major PARKER, M.P., also replied, and expressed his hope that success would eventually crown the efforts of the learned gentleman who had succeeded in inducing the Government to grant a committee to inquire into the subject of the malt tax. He trusted that the result of the inquiry would heal the wound which unjust legislation seemed to have inflicted upon the agricultural interests. The community at large must suffer from the immense and daily extending disease among cattle. An almost incredible amount of meat was daily destroyed by order of the local authorities, in different towns, on account of the disease prevailing among cattle. Now, it was admitted by every one—even, he believed, by the Chancellor of the Exchequer himself—that malt was one of the best, most nutritious, and most fattening of all products, and he hoped that the inquiry now about to be made would have the effect, not only of diminishing disease, but also of adding to our supplies of meat.

After several other toasts, in the course of which the Rev Mr. Owen, in speaking for the bishop and clergy of the diocese, argued that if the society could double or even triple the amount which it paid by way of encouragement to deserving labourers, it would increase its claims to usefulness.

Mr. COBBOLD, M.P., proposed the "Royal Agricultural Society of England," and remarked that he did so with peculiar pleasure, because he had some hopes that if the town of Ipswich and the neighbourhood would make an effort, it might induce "the Royal" to hold a meeting not very long hence in Suffolk. If the council of the society decided on doing so, he hoped the town of Ipswich would not be backward in endeavouring to induce them, by the advantages which they might be able to hold out to them, to fix upon Ipswich as the site of the meeting.

Mr. HUMBERSTON, M.P., returned thanks.

Mr. GREEN, in acknowledging the compliment accorded to the judges, congratulated the society upon the excellence of the show of horses. His brother-judges would bear him out in saying that on no occasion did they remember to have seen horses with such action; and action was what Suffolk horses lacked a few years since. It was thought by some, perhaps, that in days when steam ploughing was being introduced, cart horses would be of no value; but the same idea was entertained when railways came into vogue, and yet horses had been dearer since. He believed if attention was paid to the Suffolk cart-horse, it would be all the better for Suffolk farmers, for we never could do without good cart-horses, if they were only used to move heavy goods from one place to the other. The class of two-year-old stallions was a very good one, and the judges had observed an improvement in the feet of the Suffolk cart-horse, a point which had been complained of before.

Mr. SPOONER also replied as one of the judges of riding horses, and said he must congratulate the society upon having held so successful a meeting. He had acted as judge on several previous occasions, and he could safely say that he had never beheld so good an exhibition, take it for all in all, as that which had been witnessed during the day. He remembered, some five years since, it was his duty to perform the office of judge of agricultural horses, and he believed he had given the first premium, and, subsequently, the second and third prizes, to that animal which had received the first prize at the present meeting. He felt glad that he had given him his first three prizes, although he was entirely innocent of having given him the twenty-six which he had since earned.

Speaking of the class of riding horses, he would venture to give one or two matters of advice to breeders. One was that it cut quite as much to keep a bad horse as a good one; and the second was that breeders should take care that while they got a little more good blood, they should at the same time get a good deal more weight. Gentlemen could not have horses too well bred, but if they wished to carry out the commercial principle which had been referred to, they must also produce weight-carrying animals.

Mr. RIGDEN said a few words on behalf of the judges of sheep and pigs. He expressed his regret that Southdowns had not been better represented at the meeting; only one very good sheep of this description had been shown, and this was bred by the late Mr. Jonas Webb. He was gratified, however, to find so good an exhibition of long-woolled sheep, and he thought that in this respect the society's meetings had greatly improved since he visited Suffolk some three years since. The long-woolled rams which had been shown during the day were a credit to the county. The exhibition also included a class of sheep which he could hardly describe. They were a kind of nondescript breed, and were he not an old friend of Mr. Dobito, he should be inclined to offer a few remarks as to the impression which they made upon his mind. His idea of a sheep was that it should unite two or three qualifications, such as quality, symmetry, lightness of offal, and aptitude to fatten; but when he looked at his friend's sheep, he could only see an aptitude to eat any amount of oilcake he might choose to give them (laughter.) His friend had told

him he had kept a Southdown with some of these nondescripts, but that the Southdown had not done so well as he had expected. So that he (Mr. Rigden) replied, "I have no doubt that they ate all the feed he should have consumed, and I am only surprised they did not eat him also" (laughter.) Then, again, when the nondescripts went to the butcher, he was afraid they would be like a pig, with regard to which a Sussex man said it had not weighed so much as was expected, and he never thought it would (laughter.) He had never seen a finer exhibition of pigs, and he could assure the meeting that the judges had the greatest difficulty in deciding which were the best in these classes.

Mr. DOBITO said his old friend Mr. Rigden, had told him he had a rod in pickle for him, the other day, and now it had come out. The fact was the Suffolk sheep were progressing, and the shoe began to pinch Mr. Rigden as a Southdown breeder (laughter.) The Downs were not progressing, and the Suffolk were doing better than when the society first took the trouble to introduce them. His friend Mr. Rigden evidently thought so, or else he would never take the trouble to abuse them (laughter.)

Mr. J. H. Hedge replied on behalf of "The Stewards," and Mr. J. E. Ransome for "The Implement Makers."

Mr. BOND, the Secretary, in replying to the toast of his health, stated that the attendance at the meeting had been unusually good. Upwards of 10,000 persons had been present at the show, and the amount taken at the gates ranged between £800 and £850.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

THE COMPARATIVE EFFECTS OF DIFFERENT MANURES ON GRASS LANDS.

At the weekly meeting of the Council and members of the Royal Agricultural Society, held on Wednesday, June 24, in Hanover-square, the Earl of Powis in the chair, a lecture was delivered by Professor Voelcker, "On the Comparative Effects of Different Manures on Grass Lands."

The Professor placed on the table several specimens of fine grasses collected by himself on the previous day on Messrs. Lawes and Gilbert's experimental plots at Rothamsted, and he frequently alluded to them in the course of his lecture.

Professor VOELCKER said: My lord and gentlemen, that grass land is capable of improvement as much as arable land I think few people will deny; that there is pasture land which is more difficult to improve than other pasture land, I believe most people will admit; but that, taking a wide view of the pastures of England, there is much grass land in very bad condition, which is capable of extensive improvement, I likewise think very few persons will question. The question, then, arises, How is grass land to be improved—by what means, whether mechanical or chemical, can we increase our herbage, both as regards quality and quantity? Before proceeding further with the subject, it may, perhaps, be well to look briefly at the question what is to be considered bad and what good pasture. It may be said that good pasture is land which gives us good herbage and an abundant crop of hay, and that bad pasture is the reverse of this. But this is clearly no explanation: it is merely stating the facts in so many other words; and we are referred back again to the question, What is good or bad pasture? In answer to this question, then, pasture or grass land in general may be bad

for three reasons. First, the soil may be good enough, but unfortunately there may be too little of it. Secondly, the physical texture of the land may be bad; there may be plenty of materials, but the grass may rest on a stiff impervious clay soil three feet deep, or a subsoil which cannot be readily drained, and of which the herbage will never be very abundant, and will often come imperfectly to maturity. Thirdly, the soil may be bad, because something or other is defective in the land—some ingredient, which is necessary to the existence of the plant for its luxuriant growth and full development, is wanting. It is evident that, according to the nature of the defect in the soil, we must order our plans of improvement. If pasture is bad or indifferent on account of any mechanical or physical deficiency, it is vain to apply to such land manuring constituents, which, however useful they may be on land which is porous and well drained though naturally poor, produce no effect, or, comparatively speaking, but little effect, on undrained, wet, cold clays. The nature of the poverty of the land, whether that poverty be attributable to physical or to mechanical causes, has to be taken into account before we can properly devise means of improving grass land. Of the means of improvement, I shall have to speak presently in detail. Manuring is, no doubt, most important, perhaps it is the most important means of improving pasture land which has been drained and otherwise deprived of its superabundant moisture. The proper selection of fertilisers for grass land, however, cannot be well understood, if we disregard the special effect which certain manuring constituents are capable of producing on grass land. We cannot hope to make the best of our artificial or our natural manures if we disregard the undoubted effects which constituents like nitrogen or mineral matters, such as phosphatic manures

or alkalies, or lime, produce on the quality as well as the quantity of the herbage. And I do not know any series of improvements more calculated to bring forcibly before an observer's view the remarkable effects which certain constituents produce on certain grasses, and on the quantity or sum total of the herbage, than the very carefully-conducted experiments at Rothamsted. These experiments have been carried on now for a series of years with an amount of skill, care, and deliberation, involving great expense, which renders them extremely valuable. I speak strongly on this subject, because I think the merits of the researches of Messrs. Lawes and Gilbert have scarcely met with the amount of recognition from the great body of agriculturists and from scientific men to which they are entitled. The longer I live, the more deeply convinced am I of the necessity of carrying out in our fields experimental researches similar to those which have been conducted for so many years, and with so much profit to the farming community at large, by Messrs. Lawes and Gilbert at Rothamsted. The grass experiments which have been carried on in the home park at Rothamsted are especially valuable; and I only wish I could take my audience down to the field, and give them a field lecture there, instead of having to direct their attention to diagrams and to a few specimens which I was fortunate to secure yesterday evening, and which I brought with me this morning. I hope, however, to be enabled to show the meeting how a certain description of manuring matters fosters certain species of plants, and how it likewise increases the total quantity of produce. The most valuable manuring substances are the following—first, nitrogen in the shape of ammoniacal salts, nitrogen in the shape of nitrates or salts of nitric acid, and organic matters capable of producing on decomposition either nitrates or ammonia; secondly, the phosphates; and, thirdly, the alkalies. These are the most important. We have, however, also to consider the effects of lime and silica. Let us first inquire then, what are the effects of ammonia upon grass land. These effects I would say, in the first place, vary according to the presence or absence of available minerals in the soil; in other words, the effects of ammoniacal matters on pastures vary with the quality of the soil. If there is an abundance of mineral matter of the better description, and if this mineral matter is in an available condition, that is to say in such a state of combination that it can be reached by the roots of the plants, then ammoniacal manures are very valuable indeed, for they promote a very luxuriant development of the herbage. But if the mineral constituents—the phosphates, the salts of lime, the alkalies, and the soluble silica—are rather deficient, we must not expect to produce any very marked effect on our herbage, whether as regards quality or quantity, solely by the application of ammoniacal manures. Indeed, if we were to apply ammoniacal manures alone we should deteriorate the quality of the herbage, and within a very few seasons there would be no very large impressions visible in the quantity. But when there is an abundance of mineral matters present, the application of salts of ammonia is attended with the most beneficial effects. This you will notice if you turn to the diagram which gives the produce of the unmanured portions of the land at Rothamsted, amounting in this case to about 1 ton 6 cwt. The ammoniacal salts alone have not increased the produce nearly so much as ammoniacal salts in conjunction with mineral matters composed of phosphates and alkaline salts, and in fact all the mineral substances which are found in the ashes of grass. The produce in the latter case is very much larger; it is indeed nearly treble that in the former. You will notice therefore, in the first place, that the effect of ammonia is very much greater when there are mineral matters present. The

addition of ammonia even to farmyard manure produces a striking effect. Farmyard manure, I need hardly remind my audience, is a mixed manure containing, comparatively speaking, little ammonia, a large proportion of mineral matter, and a large proportion of carbonaceous matter. To dispose at once of the effect of carbonaceous substances, organic matters free from nitrogen, and containing chiefly carbon and hydrogen with some proportion of oxygen, I would say that in Mr. Lawes's experiments I have found scarcely any effect from them either in the quality or the quantity of the produce. It is not so much the carbonaceous part of farmyard manure which tends to increase produce as the nitrogenous and mineral portion; and as the proportion of the former, in comparison with the available quantity of mineral matters, is small in farmyard manure, the addition of ammoniacal salts to such manure is attended with most beneficial results. But the specimens which I have brought here this morning are, even better than these results, calculated to give you an idea of the special effects of ammoniacal salts. Here [pointing to specimens] we have the produce of unmanured land, and here again we have some of the herbage of the land which has been manured with ammoniacal salts. You will notice in the latter a difference in the colour: the grass is a deeper green; it is also somewhat higher, and there is more of it. There is also this remarkable difference, that whereas in the unmanured portion we have a great variety of plants, a large mixture of plants, the herbage becomes more simple through the application of ammoniacal salts. But here we have ammoniacal salts in conjunction with minerals, the effect being very striking. When ammoniacal salts are mixed with minerals there is a double quantity of produce that results from ammonia alone. This is a very remarkable effect. The extra quantity of ammonia increases the produce to a very remarkable extent, and it reduces the number of species of plants, pushing forward certain grasses to the exclusion of almost every other. Now what are the grasses or plants which are pushed out of their place by the application of ammoniacal salts? In the first place, the leguminous grasses disappear, especially if large quantities of ammonia are applied; they disappear though mineral matters may be present. It would appear, then, that if we use an excessive quantity of ammoniacal salts, the more nutritive herbs like the leguminous tribe of plants, will disappear, although the proper minerals for the growth of leguminous plants are present. It would appear indeed that ammoniacal salts, however beneficial they may be in the raising of an abundant crop of cereals, are injurious to the growth of the leguminous tribe of plants, as is seen plainly in the specimens before me. I think it would be very difficult to get, on the whole acre plot which I had the good fortune to visit yesterday, any clover. Wherever ammoniacal salts are used in anything like a large quantity the clovers disappear. In the next place, I would remark that it is almost amusing to observe how certain grasses take the place of others. Thus when a large dose of ammoniacal matter is used in conjunction with minerals, cocksfoot and tufted hair grass—cocksfoot especially—take the place of many other grasses.

Sir GEORGE JENKINSON: From what extent of surface were those handfuls of grasses before you collected?

Professor VOELCKER: From a one-acre field. They were taken merely to represent the character of the experimental plots. In order to give an idea of what may be seen on a larger scale on those plots, I cut out a portion of the produce and brought it with me. Again, in these two specimens [exhibiting two] you will notice in the height of the produce the effect which ammonia produces when applied to land which has been danged. One specimen fairly represents the charac-

ter of the herbage when farmyard manure alone is used; the other fairly represents the character of the experimental acre of ground which has been manured with ammoniacal salts and farmyard manure together. So much then with respect to the effect of nitrogenous, and more especially ammoniacal, manures. I may observe that nitrates have somewhat different effects. Nitrate of soda does not affect so materially the leguminous tribes of plants; it does not seem to injure them in the same manner that ammoniacal salts do. Then as to mineral matters, phosphatic and alkaline substances may be fairly taken together; for those tribes which are promoted in their growth by phosphatic manures are also benefited by alkaline manures, and more especially salts of potash. The action of mixed mineral manures composed of phosphate of lime in a soluble condition and salts of potash on the clover tribe of plants is very remarkable. This specimen [showing one] fairly represents the character of the portion of the field which has been manured with mixed mineral manures. You can see clover not merely here and there, but all over the field. You will find the rougher grasses less abundant, less luxuriantly developed. The cocksfoot at one spot, which is manured with mineral matters and an excess of ammoniacal salts, is very high. Here it appears almost like a different plant; it is much lower, and not so luxuriant; the rougher grasses are kept in check, and red and white clover, the wild vetch, and other leguminous plants are seen all over the field. In other words, alkalies and phosphates promote a good quality of herbage; but they have not so great an effect upon the amount of produce. Having, then, alluded to the action of these different manuring constituents on the produce, and having pointed out that mineral manures, and more especially alkaline ones, composed of salts of potash, and phosphatic materials, produce a superior herbage—that ammoniacal manures in conjunction with minerals are very productive, presenting uniformly a more simple and a rather coarser description of herbage, allow me, in the next place, to refer to some matters of detail as regards the improvement of pastures. Let us suppose that the land has been well drained, that it is moderately porous, and that there is a fair depth of soil, but that the produce is scanty, and the herbage not very good. The question arises, How is this to be remedied?—How are we to secure an improving herbage and secure a large produce of hay? I think we ought to aim at both; in most cases we ought, I think, to endeavour to improve to some extent at least the quality of our herbage, and at the same time try to get not an excessive but a remunerative amount of produce. If we look too much to quality, perhaps the means of effecting improvement may be considered by practical men too expensive: on the other hand, if we look entirely to quantity, the quality of the herbage may be much deteriorated; and the practice of improving the land solely with a view of increasing the quantity will be remunerative to the men who sell hay in the neighbourhood of large towns, but not to the occupiers of the land, or to the landlord. I think that the two things may be combined together by judicious management—that you may increase the produce, and also, to a certain extent, improve the quality of the grasses. For this purpose, I think we ought in the first place to ascertain whether a pasture requires liming or not. There is a great deal of grass land which requires liming; and as lime or marl is a cheap manure, before we go to any great expense we ought to settle this point in the first instance. Lime has done marvels on some description of grass land, while on others it has produced no effect, or, comparatively speaking, little effect, the difference no doubt arising from the fact that while some pastures contain an abundance of lime, others contain none. The geo-

logical formation of the rocks of a district is not always a good guide in deciding the question whether land requires liming or not. I have met with many cases in which lime has done an immense amount of good, although the land was situated on the oolite formation, abounding in limestone rock. The fact is, that in limestone regions there are often to be found clay soils, which are laid down in permanent pasture. These clays are soils of transportation; they have not arisen from the rocks on which they are placed, but they have been formed from other rocks deficient in lime, and have been deposited on limestone rocks. In some cases, although lime may almost come to the surface, and any one who was not acquainted with the special character of the land might say that no lime could be wanted, seeing that it came up to the surface, yet the actual soil may, notwithstanding these appearances, be very materially benefited by liming. Fortunately, this is a question which may be very readily settled. Let a little of the soil be put in a small cup or saucer, and be mixed with spirits of salt. If it effervesces strongly, that shows that there is an abundance of lime present; and in that case the land requires no liming. The absence of effervescence, however, is not always an indication that the land is deficient in lime. Soil may be in a condition in which it is not easily attacked by common spirits of salt. In that case no effervescence would take place, and yet lime may be present in the soil in sufficient quantity to meet all the requirements of the case; but by simple analysis, by chemical determination, this question may be settled in a very short time; and before we resort to any expensive means of improving pasture-land, we ought to ascertain clearly whether it requires liming or not. If land be of a light description, another question arises, namely, In what form should lime be applied? I would recommend that it should be used in the shape of marl, especially clay marl; for then we not only apply lime, but we also add to the land a material which generally abounds in alkalies, potash and soda. Moreover, what we apply acts as an absorber of the manuring matters in the atmosphere, and as a retainer of the valuable fertilizing matters which we apply to the land in the shape of manure. In the second place, we should endeavour to encourage the growth of good herbage, and to increase the quantity of the produce. This must be done by liberal manuring on well-drained land. Land which is so porous that an excess of moisture or water in wet seasons will not remain for any great length of time, and which in dry weather can by capillary attraction bring up moisture from below—such land pays exceedingly well for a judicious outlay on manure. Grass land, no matter what its character may be, should receive an occasional application of farm-yard manure; for this reason—that in farm-yard manure alone we can supply the alkalies, more especially potash, in an economical manner. We have no difficulty in supplying phosphate of lime or soluble silica, should it be needed, economically in the shape of artificial manures; but we cannot apply well and economically salts of potash, with the view of increasing our produce. If we look at the composition of the ashes of our grasses and our hays, taking the mixed grasses and leguminous plants together, we shall find that those ashes abound in potash. If we constantly mow down our grasses we thereby remove a very large proportion of the alkalies, and the result is that the herbage becomes poor, and the produce in the course of time falls. Some of the most important mineral matters are thus abstracted, and the only way to restore potash to our grass lands is to incorporate it with them in the shape of farm-yard manure. Therefore some farm-yard manure ought to be reserved for the manuring of grass land; and it is difficult to

conceive why the farmer is so anxious to apply nearly all his farm-yard manure to his arable land, and deals it out in such a niggardly manner to his pasture land. But in addition to farm-yard manure there are other fertilizers which may be used with very great effect. Guano, judiciously used, that is to say used on land like many of the clay soils which constitute perhaps most of our pasture soils, produces a very excellent effect; it increases the produce very materially. Better, perhaps, than guano alone, or bones alone, is a mixture of the two. Indeed, I should like for an average description of land the following mixture: partially dissolved bones, (by which I understand bone-dust, dissolved with a sufficient quantity of sulphuric acid to render a portion of the phosphates in a soluble condition; we obtain partially dissolved bones by applying to bone-dust one-third of its weight of sulphuric acid)—4 cwt. of partially dissolved bones, 2 cwt. of Peruvian guano, and 1 cwt. of salt, perhaps will produce a manure for pasture which, whilst it will materially increase the produce, will not deteriorate the quality of the grass to such an extent as to make it doubtful whether we should resort to the use of guano alone in the proportion of 4 cwt. per acre, or whether we should not be more sparing in the application of ammoniacal manures. We have in this mixture of partially dissolved bones and guano the mineral constituents required by our grasses and leguminous crops, and we have a fair amount of ammoniacal matter to give us a good yield. The addition of salt I recommend for the purpose of keeping land in a moist condition. When land is of a lightish character the addition of salt may, I believe, be very usefully practised; at least, from what I have seen in some experiments which I have tried myself on grass land, I am inclined to think that a moderate amount of salt may be useful for pasture. An excess of salt ought, however, to be carefully avoided. I remember that some years ago Mr. Sotherton-Estcourt tried some experiments on his own farm with nitrate of soda and salt. He used a mixture of $1\frac{1}{2}$ cwt. of nitrate of soda and $10\frac{1}{2}$ cwt. of salt, supposing that by the use of so large a quantity of salt he would bring up the money value of the mixture, and make it equal to other manures with which he had been trying similar experiments. Here the addition of salt to the nitrate of soda destroyed the peculiar effect of the nitrate almost entirely. The increase of produce was very small indeed. The same mixture when tried on another farm of Mr. Estcourt's, on very wet land, had the same effect: it actually reduced the herbage, and altogether destroyed the effect of the nitrate of soda. Salt in excessive quantity checks vegetation, overpowering the forcing effects of nitrate of soda; and hence, on wet land, it ought to be used with great judgment. In the next place I would observe that there are pastures which are materially improved by bone-dust, whilst there are other pastures which are not improved by it. The porous land of Cheshire, and similar soils on the red sandstone formation, are very much improved by the use of bone-dust. The herbage is completely changed by the application of bones. I have witnessed in many parts of Cheshire and the adjoining counties the marvellous effects which bone manure produces on the herbage. Not only do bones bring out white and red clover, but the quantity of the herbage is also increased. You get an abundance of the succulent growth of grasses. The clover itself becomes very luxuriant and its own abundance helps to increase the produce. But, on the other hand, I have been on many other pastures in the west of England where bones produce no effect at all—no visible effect at least. On land which is wet and cold, and which rests on a poor undrained subsoil, bones often produce no effect. A great many pastures in the west of England, in Somerset and Devon, a considerable portion of the grass land

in Gloucestershire, and, I may add, some of the heavy land which I have seen in Shropshire, cannot be improved by bones. The application of bones, however useful in Cheshire and other dairy districts, produces little or no effect on other lands. Before, therefore, much money is spent in the purchase of bone-dust or bone manure, I would recommend that there should be a trial of what bones will do for the land. If they prove beneficial on a small scale, it will be time enough to introduce a large quantity afterwards. There are a vast number of cases in which no visible effect will be produced, either as regards quality or quantity, by the application of bone-dust. Let me add, that in those parts of the country where bones are used with advantage, care should be taken by purchasers of bone-dust to obtain a good quality of bones; for bone-dust, particularly the smaller kind of dust, is frequently mixed with cheap materials. This is especially the case with regard to the fine bonedust sold as bone-flings, the refuse of button-manufacturers and bone-turners. Of late years this bonedust has become very much deteriorated in quality by the admixture of vegetable ivory, which is used now very largely for the turning of buttons, the combination being so complete that it is very difficult to distinguish the bone-flings from the vegetable ivory dust. The vegetable ivory nut is largely used by bone-turners for purposes for which bones are so much used; and the result is that bone-flings frequently contain a large proportion of vegetable ivory, a substance which has no more manuring value than common sawdust: it is, in fact, the same kind of material as common sawdust. Boiled bones, the refuse of the glue-manufacturers, when obtained in a dry condition, are extremely valuable for grass lands. They have then been deprived of all their fat, and of about half the quantity of nitrogenous matter. It seems most astonishing that the refuse of glue-makers still contains one-half the quantity of nitrogen which is to be found in fresh bones. There is a large proportion of phosphate in this refuse; and altogether, the fertilising matter is in a most available condition. Therefore glue-makers' refuse, when dry, is very useful in improving the pastures of dairy districts like those of Cheshire.

We have next to consider briefly the case of land which is cold and wet, and on which farmyard manure and artificial manures make no very great impression. The question is, what are we to do with such lands? I think it cannot be doubted that they are pastures which it is very difficult to improve. Some of the dairy farmers and the grass-land farmers are sometimes rather strongly blamed for not improving their pastures. Many of them will tell you that they have tried farmyard manure very largely, and have also tried various artificial manures, but have not succeeded in getting remunerative produce for their outlay of money. And I believe there is grass-land of a description which cannot be very readily improved—land which rests on a wet, undrained subsoil, and difficult to drain, and on which the manure passes away, somehow or other, without producing much effect. The question is, what are we to do with such poor, wet land as this? I imagine that we ought in the first place to ascertain whether it can be materially improved by draining. That is an engineering and altogether a partial question. Before such land has been improved by drainage, and got into a drier condition, we cannot hope materially to increase the surface-soil, and obtain any large amount of produce by the application of farmyard manure. Indeed, the application of farmyard manure, as well as the application of artificial manures, would lead to waste; and profit would be very questionable in such a case. But if we suppose the worst case—if we suppose that experience has pointed out to us that the land is not

grateful for draining, and that we cannot therefore hope, by using a large quantity of manure, to improve very much the grass-land, or to break up such land—ought we not by some means or other to improve the quality of the herbage? The question of the desirableness or otherwise of breaking up such land is one far too wide to be discussed here; and therefore I will not touch upon it. There may be good reasons for either course. But I will suppose the worst of all cases—that we have to deal with grass land which cannot be broken up, on which manure will produce little or no effect, and which cannot be drained with advantage. What are we to do with such land? Now, if I may be allowed to give an opinion founded on my own experience, I would say that I would endeavour as much as possible to increase the surface with bulky manures. I would scrape together whatever I could on the farm, in the shape of what is commonly considered valueless material; I would collect the sweepings of the yard; I would scrape the roads well, and collect the scrapings; I would employ a man to collect the droppings of the grazing stock by means of a donkey-cart, and I would keep him constantly at work in raking up the droppings, mixing them with the road-scrappings, and adding a little lime to all this material, if the land is deficient in lime; and I would thus prepare, mixing all these things well together, a bulky manure in the shape of a compost. It is astonishing what a quantity of manure may be collected in this way; and by applying such an earth-compost just at the growing season of the year, when the grasses are making a start, we can often improve very materially, if we have the compost ready.

Whilst speaking of making compost for grass-land, I would observe that the compost-manure ought to be kept for at least six months, and ought to be turned over once or twice before it is put on the land. When this is done, the air finds free access through the organic refuse matters: it converts the nitrogenous portion of them into nitric acid, which is fixed by the earthy matter. We obtain in a compost-heap which has been kept some six or eight months a considerable portion of nitre; and this has an excellent effect on the herbage, and also produces a remarkable effect on the cereal tribe of plants. By this means we may make the best of the worst description of pasture.

Very briefly recapitulating the main points which I have endeavoured to bring out in this lecture, I would remind my audience, first, that ammoniacal manures have a special effect in producing a luxuriant development of the cereal tribe of plants; that they have an effect likewise on the quantity, especially if the necessary amount of mineral matters is present. We have seen, further, that mixed mineral manures composed of phosphoric and alkaline salts increase the leguminous produce; that the sole application of ammoniacal salts ought to be avoided; and that it is best to have a fair mixture of both mineral and ammoniacal matters. Again, we have seen that there are soils which are very grateful for a liberal expenditure of money, this being the condition of a great deal of the grass land of England at the present time. The fact that there are here and there soils which cannot be improved may lead the indolent farmer to suppose that no pastures can be materially improved. Few people have any idea of the extent to which pastures may be improved, or of the economical advantages which a judicious outlay on manuring substances secures. Then, in conclusion, we have seen that on the poorest description of grass land waste matters, the droppings of cattle, earthy substances, and such like, may be conveniently made into a compost manure, which on such soils will produce a very excellent effect (cheers).

Sir GEO. JENKINSON wished to know whether the differ-

ent grasses exhibited in the room were culled, or whether they fairly represented the surface of the whole field.

Professor VOELCKER replied that the specimens represented as nearly as possible the general character of the experimental plots.

Mr. THOMPSON said, having had an opportunity of seeing the experimental plots on the previous day, he could corroborate that statement. The plots consisted of an acre each, and if there was one thing more striking than another, it was the uniform character of the herbage over each of the plots. There might be some differences arising from movements of the sheep, the after-crop being always eaten off, but the exceptions owing to that cause were confined to a very small proportion of the plots; and taking the plots as a whole, nothing could be more striking than the distinctness with which one could trace in the herbage the places where the different applications of manure had been made. He had been in the habit of visiting the plots for several years. Not having seen them for the last two years, he had just visited them again, and the development of the particular characters of herbage on the different plots which had been treated in a particular manner, and in a succession of years, struck him very much. It showed that they had at their command herbage which could be grown on land that did not appear at all suited to the growth of grasses, or, at all events, was not what they would naturally call good grass land. They had only to look at what was growing in other parts of the farm to see that this land at Rothamsted was naturally, not only not first-rate grass land, but not even grass land of good quality. The soil was a strong clay, much better suited naturally for the growth of wheat and beans than for the production of grass; yet it was clear that they could grow on such land almost any herbage they pleased. The question was rather one of money, and of the particular kind of herbage required, than anything else. He must say it appeared to him strange, considering the kindness of Mr. Lawes in showing the plots to any one who visited him, that a much greater number of persons did not go to Rothamsted. The land there appeared the most extraordinary illustration of the effects of manuring that any one can conceive. Besides the experiments with the grasses, there were similar ones with wheat and barley; and all the experiments had been carried on with such care and accuracy that they might be thoroughly depended upon. They had, in fact, been continued so long that each plot had now developed its own peculiar character. He ventured to say that in a single morning, farmers, by walking up and down these plots, and making proper inquiries, might obtain more knowledge of experimental farming, and of what might be done for the improvement of various kinds of land, than they would acquire in a lifetime on their own farm or a neighbour's (Hear, hear).

Sir GEORGE JENKINSON would be glad to hear under what head Professor Voelcker would class liquid manure which flowed from a cesspool tank. He asked this question because he had himself tried the experiment of conducting the superfluous sewage of a cesspool on to his own farm, and wherever it was allowed to run, there was a marked line of thick, rank, dark-green grass; it was, in fact, twice or three times as thick as the grass in other parts. The cesspool contained all the sewage of his house, which was conveyed to the land by means of pipes; and the Professor having spoken of various kinds of manure, he desired to know under what head that manure was to be placed.

Professor VOELCKER said the liquid manure alluded to would be chiefly ammoniacal manure; but, inasmuch as it contained also mineral matters, it was a mixed ammoniacal

and mineral manure, and that admixture was, no doubt, the cause of the abundant development of herbage which had taken place.

Sir G. JENKINSON observed that the land was a stiff clay, in Gloucestershire.

Mr. DENT, M.P., said he wished to ask the Professor one or two practical questions. First, as regarded soils which required liming, he would like to know in what condition the Professor considered it best to apply lime? whether he thought it should be applied by itself to the grass, or whether he would recommend that it should be made into a compost with rubbish and soil? He would also be glad to know what time of year was best for the application of lime, and also for the application of artificial manures to grass land? When they talked there about mixed manures and ammoniacal manures, the Professor, and all who had made experiments, of course knew what was meant by such terms; but probably a good many farmers would like to be informed what they should apply as a mixed mineral manure. He should himself suppose that dissolved bones would be as good as anything. He could not help thinking that the dressing proposed by the Professor was a rather more expensive one than a great many of his own tenant-farming acquaintances would like to apply. He (Mr. Dent) calculated that 4 cwt. of dissolved bones would cost 7s. per cwt., making 28s.; that 2 cwt. of guano, at £18 a ton, would cost 36s.; and that 1 cwt. of salt would cost 1s. That would give a total of 55s. per acre; and he did not think tenant farmers generally would be disposed to expend more than £2 per acre in manuring their grass lands. He would therefore venture to suggest as a suitable dressing 3 cwt. of superphosphate, $\frac{1}{2}$ cwt. of sulphate of ammonia, and $\frac{1}{2}$ cwt. of guano, which together would come to about 35s. per acre, and would be a very good manure for grass land.

Mr. LEE: Did the Professor intend to recommend the application of so large a quantity as 7 cwt. of artificial manure per acre for grass land?

Professor VOELCKER: I have no doubt that on some land that quantity might be used with advantage.

Mr. LEE: But, generally speaking, I should have thought 2 or 3 cwt. would be enough. Did your experiments go up to 7 cwt.?

Mr. THOMPSON: Mr. Lawes's did.

Sir JOHN JOHNSTONE, M.P., said Mr. Lawes's experiments went up to 8 cwt. per acre; but where 8 cwt. had been put on the land the greater feeders amongst the plants, including the enormous cock's-foot, of which they saw an example in the room, grew very strongly; and Mr. Lawes expected that within two or three years the cock's-foot, being the strongest feeder, would drive out almost every other grass; in fact, that the plot would become a bed of cock's-foot. That showed what was the effect of an excess of ammoniacal manure. It appeared to him from what he had seen that the cock's-foot was getting ahead of everything; it was even driving out the other common grass feeders, such as the *Holcus lanatus*, which was a very coarse feeder. That he observed on the previous day. The *Holcus lanatus* was clearly yielding by degrees to the cock's-foot, and the latter was getting the mastery.

Professor VOELCKER, in reply, said with respect to the time of applying lime to the land, he imagined that autumn was the proper time. As regarded the various modes of applying it, he liked the Devonshire mode best. In that county it was put on the land in small heaps, and covered over with earth: it thus got spontaneously slaked. Early in the spring it was spread in lumps over the land, and the lime was washed in by degrees.

Mr. DENT: You must cart your soil, and cover the heaps on the grass land.

Professor VOELCKER observed that whatever could be obtained from the ditches or the road-sides would do: it was not necessary to make a regular compost heap where earth was available. It was a good plan to get lime slaked in that way; it then fell into a finer powder, and could be more easily distributed on the land. With regard to the time of applying farm-yard manure, he was inclined to think that it ought to be used about Christmas. As to artificial—guano, superphosphate, and other similar manures—perhaps the end of January or the beginning of February would be a good period for applying them. As regarded the quantity of artificial which might be used with advantage, that was, he might remark, an open question (Hear, hear). He purposely gave a liberal application, knowing that most tenant-farmers were not inclined to spend any money at all. With the view of pushing them a little further than they were likely to go, he recommended a larger dose than perhaps he might see himself (laughter). But they had only to divide by two to get a very good manure (Hear, hear). If instead of 4 cwt. of dissolved bones and 2 cwt. of guano per acre, they were to take 2 cwt. of dissolved bones and 1 cwt. of guano, they would still get a very good manure; and if the dose should still be found too expensive, what he had recommended might be divided by three. He had been more anxious to point out the relative properties of dissolved bones, guano, and salt, than to fix upon any particular quantity of manure for grass land (Hear, hear). He might just remind the meeting that there was one manure of which advantage might be taken in the neighbourhood of towns. Soot might in such a position often be obtained at a moderate price, and on pastures it produced very good results.

Mr. FARRER: What do you call a moderate price?

Professor VOELCKER: About 6d. a bushel.

Lord WALSHINGHAM: But it is almost always adulterated.

Professor VOELCKER: Even at 8d. a bushel it would if pure—not if largely mixed with sawdust—be a profitable manure. It was in fact a cheap manure. It owed its efficacy chiefly to sulphate of ammonia—the very manure which has produced such a marked effect in Messrs. Lawes and Gilbert's experiments on grass land.

Mr. FARRER said among those who were present on that occasion was Professor Buckmann, who was particularly familiar with the different varieties of grasses. That gentleman had gone very carefully over the experimental grass plots at Rothamsted with Professor Voelcker; and there were some points connected with them on which he would no doubt be able to throw considerable light (Hear, hear).

Professor BUCKMANN said in going over Messrs. Lawes and Gilbert's plots on the previous day, he was much struck with the manner in which the experiments were being carried out, and also with the scale on which they were conducted. The meadow was divided into two parts; one part being left in its natural state, and the other staked off with a view to the experiments. Among the natural grasses he saw almost every species of grass which was usually met with, and that too on land not of very extraordinary quality. This was a very striking fact. If a man went from one end of England to the other—say from Mr. Lawes's farm to the Land's End in Cornwall—he would find that almost every ordinary meadow contained the same species of grasses. Occasionally one met with grasses of a peculiar character; but the real grasses were nearly always alike. There was this important fact to be observed with regard to the proportion of the different species. In one part of England they would find that one kind of grass had almost taken possession of the land, other kinds being

hardly represented. That fact was interesting in connection with these experiments. If he took two species of grasses, one being, say, the *Festuca pratensis*, a very rich grass indeed—if he examined a plot and found that grass prevailing, and compared it with the land which was not manured, he would see there that grass above represented. So, again, with regard to the *Festuca durinacula*, in the part which had been so highly manured, and which had the mixture of phosphate with alkalis, he found the *Festuca durinacula* was not present in such large quantities as the *Festuca pratensis*. Where the *Festuca pratensis* prevailed, there was a distinct kind of manuring from that which was adopted where the *Festuca durinacula* prevailed. Had he been at all aware that he should be called upon to speak he might have entered into the subject more fully. He must say that he entirely agreed with Professor Voelcker as to the advantage of visiting the plots, and that which he saw on the previous day convinced him of the very great advantage of field lectures on agricultural subjects in comparison with lectures in a room (Hear, hear). One thing which struck him in examining the plots was that in the case of impoverished grasses there was a great number of species mixed together; whereas as soon as the land had been dressed with certain manures a sort of war of extermination commenced. Not that the poorer grasses could ever be entirely eradicated; but when good grasses had begun to spring up in any quantity, the poorer species declined. How far chemistry would account for it he did not know, but it would be easy to make a list of grasses, and give to each its positive status with regard to nutritive power; and the tendency of certain manures had been to drive out some species of grass, and encourage the growth of others to a most extraordinary extent. It was an important fact that on these experimental plots the grasses had actually been mown every year. In mowing grasses every year it would be found that almost all the good and more important species would be, if not driven out altogether, at all events brought into a state of impoverishment; they would become so small and poor that it would require the eye of a botanist to distinguish them; but let the land have been manured with different manures, and it would be found that, according to the manure employed—whether it were a manure that would produce muscle or a manure that would produce bone, or whatever might be its nature—they would have the grasses which would produce the ingredients in question to the fullest possible extent. This had struck him very much indeed in the case of an estate with respect to which he had been recently consulted, called Buscott Park, where there were several thousand acres which were either being converted from arable into grass lands, or, being grass lands, were being as far as possible improved. On that estate some of the grasses were excessively poor. The question came before him, whether there would, in that case, be any advantage in taking off the turf, digging the land underneath, and returning the turf again. Another question which he had to consider—and it was a very important practical point—was whether, when the turf was very bad, showing a preponderance of poor material, it would be the quickest method of making good grasses to plough up the land altogether and sow it with grasses. To the first question he was obliged to give this answer—that ploughing the soil and returning the turf would, perhaps, cause some little appearance of freshness for the first year, but that it would do a very great deal of injury to the turf. For, with all the appliances of manure, there was one thing which ought to be particularly attended to, in relation to the improvement of grasses, and that was mechanical action. Without sufficient mechanical pressure, grass would grow up very much in the form of

jungle, and there should, therefore, be an endeavour to make the different parts of the soil adhere as closely as the wool used in making a piece of cloth. Then with regard to the operation of merely ploughing the land, he could only reassert what he thought had been clearly proved by Dr. Voelcker, that that would add nothing to the staple of the soil. Something was, of course, wanted where the grasses were poor; but the process of ploughing would add nothing to the quality of the soil, while, on the other hand, the compact nature of the turf would be destroyed. Moreover, while the land lay fallow, a great deal of mechanical pressure would be necessary to get it into a state of improvement. With regard to the second point, he saw quite sufficient in the experimental plots on the previous day to throw great light upon it. The application of certain manures appeared to have turned the grasses topsy-turvy, that was to say, taking the same space for a comparison. There was 50 per cent. in parts of the field which were not manured at all, while in other parts of the same extent there was seventy or eighty per cent. with only one or two years' manuring. In that way it had been proved, he thought, that inasmuch as in almost all turf, however poor it might be, some of the better grasses were represented along with the poorer ones, whenever they began trying to ameliorate those grasses, they would see evidence that an amelioration was taking place in the circumstance that the poorer grasses were gradually dying out, while in dying out they not only afforded space for the better grasses to grow, but their substances afforded a manure on which the better grasses thrive. These experiments of Mr. Lawes's appeared, therefore, to him (Professor Buckmann), fully to bear out the fact that in order to ameliorate poor grasses and place the richer grasses in a majority, the best and cheapest course was to apply to the land different kinds of manure (Hear, hear). He left it to the chemist to say what kinds of manure were required in each particular case; but he would assume it to be a positive fact that, aided by a combination of chemical with botanical knowledge, they would be enabled within a very short time to predicate from the appearance of pastures, not only in what respect grass lands were defective, but also what kinds of substances were required in order to remedy the defect (Hear, hear). He had some floating notions in his mind that such would be the case, before the preceding day; but what he then saw had completely convinced him. Perhaps the whole of the land unmanured would yield a ton per acre; but on some of the manured plots—and they were placed side by side, so that there was no difficulty in judging—the produce was as much as three tons per acre (Hear, hear). The change which had taken place as the result of the manuring, both in the quantity and the quality of the herbage, was enormous. During his visit the question arose in his mind, whether such an enormous amount of produce could be got for the hayrick, the feeding qualities of the grass being undoubted. From what he saw of the plots which were so highly manured, he concluded that they afforded what he should call an exceedingly strong hay—hay which had, to use an expression common among farmers, a very great amount of "proof" in it—hay which, while it would support growing stock, and assist them to grow, would add rapidly to the muscle and the fat. He should state, however, that there appeared to be an absence in these grasses of what would be termed fattening materials. It was possible, he thought, so to manage manures as to make a great change, not only in the species and quality of grasses, but also in the quantity of the produce. So, also, they might be enabled to decide the question whether it were well to employ grass-land always for grazing, or always for making hay. Probably Professor Voelcker would some day

be enabled to show that the plan which would yield the greatest amount of produce was, sometimes to take hay, but not to take it so constantly as had been done in the experimental meadow. He could almost wish that, for the purpose of the experiments, part of the meadow had been mown, and the rest depastured occasionally, in order that they might see what change would take place through the depasturing, and what difference of quality resulted from a mixed course of hay and pasture (Hear, hear).

Mr. WREN HOSKYNs said it should always be borne in mind, with regard to grass, that it was a crop which was perpetually growing in the same soil; that there was only one layer of earth below the grass, and that that had to furnish every year, either for the scythe or for the pasturing of cattle, a crop which never received any change like that which the arable crops received from the use of the plough, or the inversion of the soil, or the addition of fresh soil from below. Consequently, in applying manure to grass-land, he had always derived the greatest benefit from mixing manure with a large quantity of soil from every quarter from whence it could be collected—roads, ditches, and so forth. However inferior this might be in quality, it contained an enormous amount of that mineral element which was continually going away from the soil. The quantity of waste soil which grass would grow through, if such soil were applied in the winter, was very great; and hence a dressing might be given which in a few years would almost give the grass an additional bed to that in which it originally grew. If something of that kind were not done, and manure was constantly being applied in a stimulant or ammoniacal form, they were to a certain extent increasing the evil which was always in operation. He observed that Professor Voelcker supported that view in speaking of the effect of ammoniacal manures, in certain cases, on the character of the soil. This point appeared to him (Mr. Hoskyns) well worthy of attention (Hear, hear).

Mr. THOMPSON said in looking at the experimental plots on the previous day he particularly noticed that although this was only the seventh year in which the grass experiments had been made, the plot which had been manured with ammoniacal dressings without mineral manures had clearly failed; whereas on land which had been cultivated every year with wheat the application of ammonia without mineral manures had produced a good crop even after 20 years. That showed what a great difference there was between the management of grass land and the management of arable land (Hear, hear). Mr. Dent having inquired as to the best mode of applying lime to grass land, he (Mr. Thompson) would just mention the practice in that respect in Yorkshire, where lime was the principal manure; the part of the county to which he especially alluded being the district of Craven. It was well known that although on the mineral carboniferous limestone the grass grew in such quantities that they could fatten large beasts upon it, and was sufficient to keep milch cows and fatten beasts and oxen in winter, merely on account of the quality of the hay, yet hardly any manure was used there except lime. The general practice was to put on the land a large dressing of lime in a hot state, just as it came from the kiln, and to spread it over the soil so thickly as to make it appear quite white. This practice was found to answer very well, though the district was a lime one, and in many places the soil was not much above the limestone itself.

Mr. DENT inquired when the lime was put on the land?

Mr. THOMPSON said it was applied at all periods, sometimes after mowing, in which case the after-grass was given up on account of the application of lime. With regard to the quantity of manure to be applied to grass land, Mr. Dent ob-

jected to Professor Voelcker's estimate as being too high or beyond the means of tenant-farmers generally; and the Professor in noticing that objection said the quantities which he had given might be divided by two or even by three. Now he (Mr. Thompson) must protest against the last-mentioned process of division (Hear, hear). A rather large experience in experimental manuring had convinced him that if they wanted to improve grass land it would not do to trifle with the matter, and that the outlay of money on a very small application would probably be thrown away (Hear, hear). Instead of manuring with a small quantity one year and another small quantity the next, it would be better to apply the whole amount in one year, inasmuch as a very light dressing was almost sure to be lost, while one heavy dressing produced a change in the quality of the grass which was visible for years (Hear, hear).

Mr. FARRER thought that when lime was under consideration, it might be well to examine into the different qualities of lime derived from various sources.

Mr. WREN HOSKYNs wished to add one word with regard to the time for applying farmyard manure. The practice which prevailed among farmers in this country was, he believed, to apply it just at the time when the young grass was shooting. Although the Professor recommended its application in February, yet if the ammonia was to act on the leaf of the growing plant, that did not appear to be the best period. Perhaps, after all, the best period for the application of farmyard manure was during the months of July and August, when the grass was growing again after the mowing; and that was, he thought, almost the universal practice.

The CHAIRMAN said he thought that after the discussion which had taken place nothing now remained for them to do but to thank Dr. Voelcker for the lecture which he had been good enough to give them (Hear, hear).

The meeting then separated.

MONTHLY COUNCIL, *Wednesday, July 1.*—Present, Viscount Eversley, President, in the Chair; Lord Walsingham, the Hon. W. Cavendish, M.P., the Hon. Major-Gen. Hood, Sir E. Kerrison, Bart., M.P., Sir A. K. Macdonald, Sir Watkin W. Wynn, Bart., M.P., Mr. Raymond Barker, Mr. Barnett, Mr. Bowly, Mr. Bramston, M.P., Mr. Cantrell, Mr. Dent, M.P., Mr. Druce, Mr. Erall, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Holland, M.P., Mr. Hudson, Mr. Jonas, Mr. Lawrence, Mr. Pain, Mr. Pope, Mr. Randell, Mr. Rigden, Mr. Sanday, Mr. Shuttleworth, Mr. Thompson, M.P., Mr. Torr, Mr. Burch Western, Professor Wilson, Mr. Frere, and Professor Simonds.

Colonel Kingscote, M.P., of Kingscote, Gloucestershire, was unanimously elected a member of Council in the place of Mr. Banks Stanhope, M.P., resigned, on the nomination of the Hon. W. Cavendish, M.P., seconded by the Hon. Major-Gen. Hood.

The following New Members were elected:

Airey, Geo., Sherbrooke, Linden, Malvern, Herefordshire
Akers, Henry, Black Burton, Faringdon, Berks
Alder, Frederick Jno., Hagworthingham, Spilsby, Lincolnshire
Allen, J., Roscoe, Oak House, Preston, Lancashire
Bailey, Henry, The Gerwyn, Wrexham, Denbighshire
Barford, William, Peterborough, Northamptonshire
Bidwell, Chas., Muriel, Ely, Cambridgeshire
Blick, John, Hill Court, Droitwich, Worcestershire
Blinkhorn, Thomas, Spalding, Lincolnshire
Bowen, John, jun., Dunval House, Bridgenorth, Salop
Brown, Robert, Wigginton House, Tamworth, Staffordshire
Buckle, John, Uckington, Cheltenham, Gloucestershire
Campbell, Charles Lee, Thurstaston Hall, Neston, Chester

Carrington, T. S. Townsend, Eaton Dovedale, Doveridge, Derby

Carrington, William T., Hollington, Uttoxeter, Staffordshire
Cartwright, Wm. George, Newport, Monmouthshire
Charley, Richard, Cleobury North, Bridgnorth, Salop
Clarke, Charles, Ashby-de-la-Lound, Sleaford, Lincolnshire
Daniel, Charles R., Clayworth, Bawtry, Notts
David, Evan William, Radz Court, Cardiff, Glamorganshire
Davison, Richard, Driffield, Yorkshire
Dent, John Coucher, Sudely Castle, Winchcombe, Gloucestershire
Drew, Edward, Calcot, Kingscote, Wotton-under-Edge, Gloucestershire

Driver, Robert Collin, 4, Whitehall-place, London
Fisher, Charles, Prospect House, Whitehaven, Cumberland
Fletcher, Joseph, Whitehaven, Cumberland
Fuggle, T. G., Worcester
Gardner, W. A., Hough Green, Chester
Gaunt, Thomas, Smite, Worcester
Gell, Robert, Grimston Lodge, York
Goodwin, George, Pershire Mills, Pershore, Worcestershire
Greene, John, Millbrook, Magany, Kildare, Ireland
Hanson, Thos. Anderson, 162, Upper Brook-street, Manchester

Harris, Thomas, Stonylane, Bromsgrove, Worcestershire
Heath, John, Bickley, Tenbury, Worcestershire
Hill, Henry, Spalding, Lincoln
Hill, John, Elderslie House, London-road, Worcester
Hill, Rev. Reginald Pyndar, Bromesbarrow Rectory, Ledbury, Worcestershire

Hone, Henry, Stoke Orchard, Cheltenham, Gloucestershire
Hughes, John, Britannia-square, Worcester
Hughes, John, jun., Severn-terrace, Worcester
Isaac, John Whitmore, Boughton, Worcester
Jacobson, Christian C., Cranham Farm, Cirencester, Gloucestershire

Le Fenora, Henry John, Les Nièmes, St. Peter's, Jersey
Lloyd, Francis, Worcester
Marriott, Ed. Jno. Beckett, Avon Bank, Pershore, Worcestershire

Mayos, Thos. Lee, Hampton Bishop, Hereford
Meville, Alex. S. Lealie, Branston Rectory, Lincoln
Morris, Lieut.-Col. Wm. Jno., Heppington House, Canterbury, Kent

Muckle, Robert, Cresswell, Morpeth, Northumberland
Needham, Frank Haywood, Fearnall Heath House, Worcester

Newton, Charles Edmund, Mickleover, Derby
Parrington, John, Bracepath, Durham
Parsons, Chas. William, Anstrey, Atherstone, Warwick
Pike, Aaron, Milton, Tewkesbury, Gloucestershire
Porter, J. T. B., Lincoln
Prichard, Chas. Henry, Westown House, Brialington, Bristol, Somersetshire

Robinson, George, Slimbridge, Stonehouse, Gloucestershire
Sadler, Robert Stebbing, The Valley House, Langham, Colchester

St. Leger, Major John, Park Hill, Rotherham, Yorkshire
Savage, Saul Powell, Leys Farm, Wootton-under-Edge, Gloucestershire

Smith, William J., Monkland, Leominster, Herefordshire
Swaine, John C., 3, Chester terrace, Cirencester, Gloucestershire

Taylor, Wm. Henry, High Hatton, Shawbury, Salop
Thompson, Andrew, Berwick-on-Tweed
Turner, Frederick John, The Dean, Kilmarnock, Ayr
Voile, John, jun., Churchover, Rugby, Warwickshire
Wailes, John Merrick, Gloucester
Weaver, Wm. Henry, Moor Farm, Bridgnorth, Salop
Willett, William, Bishampton, Pershore, Worcestershire
Wood, James, Pinwal Hall, Atherstone, Warwick

FINANCES.—The Hon. Major-General Hood presented the report, from which it appeared that the Secretary's receipts during the past month had been examined by the Committee and by Messrs. Quilter, Ball, and Co., the Society's accountants, and found correct. The cash balance at the banker's was £2,585 ls. 11d. The quarterly cash accounts to June 30, and the quarterly statement of subscriptions and arrears, were laid on the table, the

amount of arrears, including those for the current year, being £862.

JOURNAL.—Mr. Thompson, M.P., chairman, reported that the prize of £25 for the best Essay in Class II., on the Breeding of Hunters and Roadsters, had been awarded to Joseph Gamgee, Esq., Senior, New Veterinary College, Edinburgh. In Class IV., the prize of £25 for the best Essay on Reclaiming Waste Lands, had been awarded to Mr. Charles Belcher, Little Coxwell, Faringdon, tenant of Potter's Hill Farm, Wickwood, Oxon. In Class V., "On Moveable Fencing for Sheep," none of the competing essays are considered worthy of the prize.

The committee recommended that the sum of £60 be placed at their disposal for the preparation of an index for the 25 vols. constituting the first series of the *Journal*, which was negatived, the Council resolving that the index should be prepared by the editor.

Members of Council were requested to forward to the Secretary suggestions for Prize Essays in 1864.

WORCESTER SHOW.—Mr. Fisher Hobbs reported that the Show-yard was complete, the sheds in process of being covered, and that the whole would be ready by the 10th inst. A sufficient supply of green vetches had been secured in the neighbourhood.

On the motion of Mr. Dent, M.P., it was resolved that the Stewards of Stock shall be empowered to expend a sum not exceeding £30 in payment of a Report on the Stock exhibited at Worcester.

The Common Seal of the Society was affixed to the Agreement with the Mayor and Town Clerk of Newcastle-upon-Tyne that the County Meeting for 1864 should be held in that city.

Mr. Manning, of 251, High Holborn, contractor for the Show-yard works at Worcester, having attended the Council, was informed that the Council will give him the preference for the Newcastle contract, provided that his terms be acceptable to the Newcastle Committee.

The General Newcastle Committee consisting of Viscount Eversley, Chairman,

Powis, Earl of
Portman, Lord
Tredegar, Lord
Cavendish, Hon. W., M.P.
Hood, Hon. Maj.-Gen. A.
Nelson
Liddell, Hon. H. G., M.P.
Headlam, Right Hon. T. E., M.P.
Macdonald, Sir A. K., Bart.
Ridley, Sir Matthew White, Bart., M.P.
Wynn, Sir Watkin W., Bart., M.P.
Arkwright, J. Hungerford
Barnett, Charles
Beaumont, S. A., M.P.
Bramston, T. W., M.P.

Cantrell, Charles S.
Challoner, Colonel
Dent, J. D., M.P.
Gibbs, B. T. Brandreth
Hobbs, Wm. Fisher
Holland, E., M.P.
Hoekyns, C. Wren
Kingscote, Colonel, M.P.
Milward, Richard
Newcastle, Mayor of
Pain, Thomas
Pope, Edward
Ramsay, G. H.
Randell, Charles
Shuttleworth, Joseph
Thompson, H. S., M.P.
Torr, William
Wilson, Jacob

The Council then adjourned till 12 o'clock on Wednesday the 8th July for the election of members.

At an adjourned MONTHLY COUNCIL held on Wednesday, the 8th July, the Right Hon. Viscount Eversley, President, in the chair, the following new members were elected:—

Anderson, William, Bent House, South Shields
Angus, George, The Grange, Wallend
Arkle, Thomas, Shaftoe, Newcastle-upon-Tyne
Baker, Eliza Maria, Thorngrove, Worcester
Baker, Henry Orde Lloyd, Hardwicke Court, Gloucester
Barneby, William, Clater Park, Bromyard
Beet, James, jun., The Hill Top, Tembury
Bridges, Joshua, London Road, Worcester

Brisson, Sir Robert, Bart., Crofton Hall, Wigton
 Brown, Thomas, Townsend, Horton, Devizes
 Cartwright, Geo. Kingsford, 14, Upper Seymour-street West,
 Censnaught Square
 Cattley, Richard, Worcester
 Cavan, Colonel Philip Charles, Longparish, Whitechurch, Haats
 Clarke, Jno. William, Cambo, Newcastle-upon-Tyne
 Clay, Charles, Whitechurch, Salop
 Cooke, Jno. Russell, Woodhampton House, Stourport
 Cooper, Joseph, Redmarley, Newent
 Cooper, Benjamin, Pittingham, Wolverhampton.
 Coulson, John, Killingworth, Newcastle-upon-Tyne
 Croome, J. Capel, Cerney House, Cirencester
 Drinkwater Fred., Madley, Hereford
 Dudfield, Benjamin, Spetchley, Worcester
 Edwards, Jno. James, Broad Heath, Presteiga
 Fletcher, John, Sandway Lodge, Northwich
 Foster, Richard G., Gloucester
 Foster, T. Nelson, Gloucester
 Freeman, Thomas, Benton Place, Newcastle-upon-Tyne
 Garfit, Charles, Wischam Cottage, Kantsford
 Good, Samuel C., Aston Court, Tenbury
 Gow, Thomas, Cambo, Newcastle-upon-Tyne
 Hare, Thomas William, Berthadu, Caesws, Montgomery
 Hatherton, Lord, Teddesley, Penkridge
 Haywood, Edward W., Silkins, Bromsgrove
 Hemming, George, Pershore
 Heslop, Isaac, Urpeth, Chester-le-Street, Durham
 Hewerson, Nelson, Newport, Monmouthshire

Holl, William, Link Tower Lodge, Malvern
 Holland, Francis D., Cropthorne, Pershore
 Humphries, John, Kidderminster
 Jobson, William, Buteland, Hexham
 Johnson, John, South Pickenham, Swaffham
 Leese, Charles Stewart, Divan Court, Eastling, Faversham
 Marshall, James, West Hartford, Bedlington
 McLaren, William, North Gosforth, Newcastle-upon-Tyne
 Moseley, Henry, Westside Court Farm, Hereford
 Neek, Thomas, Sutton Maddock, Shiffnal
 Pace, Edward Henry, Pershore
 Parkes, Theo., Warridge Lodge, Grafton Manor, Bromsgrove
 Parnell, John, Rugby
 Peel, Xavier, Denant, Haverfordwest
 Phillipot, Harvey, Weston Lodge, Thames Ditton, Surrey
 Powell, Alfred, Avenue House, Worcester
 Prosser, John, Holme Lacy, Hereford
 Read, Henry, Beccles, Suffolk
 Reilly, George Hyde, Knight's Hill, Surrey
 Robinson, Rowland, Fenny Drayton, Nuneaton
 Stephens, S. H., Offozey, Tong, Shiffnal
 Tremayne, John Heligan, St. Austle
 Webb, William, Worcester
 West, Thomas, Worcester
 Wigham, George, Laverick Hall, Leaton, Dalvel
 Wilkins, Walter, Gloucester
 Wilson, William Berry, Blagdon, Cranlington
 Woodward, Thomas, High House, Seven Stoke.
 The Council then adjourned.

WORCESTER AND WORCESTERSHIRE.

The Royal Agricultural Society of England have just celebrated another anniversary in the ancient city of Worcester, in the heart of a fine agricultural county. For the benefit of some amongst the thousands who make their annual pilgrimage to this shrine of Ceres, attention is directed to the following facts:

Worcestershire is for the most part a flat county; on the eastern and western sides are two nearly parallel ranges of hills, which partly bound and partly intersect it; the intermediate space is nearly a level plain. The eastern range of hills commences north of the Clent-hills, runs by way of Broomsgrove, and terminates at Evesham. The western range commences in the neighbourhood of Bewdley, and runs S. to the great chain of Malvern Hills, in which it terminates.

The geology of Worcestershire, as detailed by Sir R. Murchison, is varied. The outcrop of the new red sandstone, lias, and oolite occupies the largest portion of the county; other formations are visible in the chain of the Malvern hills, Tenbury, Bewdley, and elsewhere. The new red sandstone comprehends that district which is watered by the Severn, together with the N.E. part of the county. The lias formation is found at Pershore and Evesham, and in the vales watered by the Avon. The portion of the Malvern Hills within the boundary of Worcester consists of trap; while the Silurian rocks, the Caradoc sandstone, Ludlow rock, and Wenlock limestone appear in the northern portion of the chain. The lower coal and ironstone beds are found at its termination, N. of Abberly Hill, in the forest of Wyre.

The form of the county nearly approaches a parallelogram—two-thirds of the area of which lie to the east of the Severn. From the heights bordering it at different parts, it presents the appearance of a rich plain, the more gentle elevations being hardly discernible. The Vales of Evesham and Severn, with that of the Avon and Teme, are but little elevated above the level of the tide in the Severn; and from their level the uplands rise gradually in gentle slopes, swelling to the height of from fifty to

two hundred feet. Some of the highest peaks of the Lickey range, N.E. of Broomsgrove, are 900 feet high: some of the Abberly hills are of the same altitude, together with the Bredon hill to the south of Pershore. The loftiest is the Malvern range, which separates Worcestershire from Herefordshire, some of whose points attain the height of 1,800 feet above the Severn.

Worcestershire is beautifully wooded: oak and ash timber are seen in perfection in the neighbourhood of the principal seats. The hedgerows are stocked with splendid elm timber, which is cut, and finds its way to market either by rail or water. This county formerly contained the royal forest of Wyre and Frekenham and the chase of Malvern, which have long been disafforested, though the forest of Wyre, extending from the north-western border of the county, near Bewdley, still contains much timber, and the underwood is largely used for hop poles.

The mineral products of this county are not very important. Coal is obtained in the north-western part of the county, particularly at Manble and Pensare. One of the seams has the extraordinary thickness of thirty feet, and is worked in separate storeys. Its mineral stores of rock salt and salt springs deserve particular mention. Rock salt is undoubtedly a chemical precipitate, and one that is going on as rapidly as ever, in the present day. In isolated seas, such as the Dead Sea, where the water is entirely saturated with salt, evaporation doubtless causes a precipitation on its bed. Here and in shallow lagoons, such as the lemans of Bessarabia, south of Odessa, that dry up in summer, we have the formation of rock salt going on perceptibly. Thus the presence of salt gives some clue to the geological history of the neighbourhood where it exists. The mountain limestone is so worked at Dudley, that the town is completely undermined by stupendous quarries. Freestone for building is obtained in several places, together with other silicious and calcareous stones.

The soils are remarkable for their general fertility, and add a peculiarly rich verdure to a district presenting

great beauty of outline, and enjoying an eminently fine climate. Those of the valleys traversed by the principal rivers consist of a deep rich sediment, which has been deposited by floods during a long series of ages: this sediment is in some places a pure clay, adapted to the making of bricks, but generally consists of a rich mould. The valleys of the Severn and Avon, the Stour and the Salwarpe, and nearly all the smaller streams, consist of rich natural meadows and pastures; while that of the Tems abounds also with hop plantations and orchards. In the valley of the Stour small tracts of peat bog are found. Rich clay and heavy soils occupy nearly half the county in its middle, southern, and western districts, and, besides the ordinary crops of other counties, produce great quantities of hops and fruits. The substrata of the Vale of Evesham are various, being sometimes a yellowish gravel, and at others a clay which is unfit for making bricks. About Kidderminster and Stourbridge light sandy soils prevail to a very great extent; some of them are poor and barren, as at Mitton and Wolverley. To the north-east of Bromsgrove, including the hilly cultivated tracts, a mixed gravel abounding in springs, and a gravelly loam, are found; also in this part a moist clay loam reposes on a broken rocky substratum: the lands on Bromsgrove Lickey have often a deep substratum of sand, but on the higher part of it they rest immediately upon an irregular granite rock and soft pudding-stone. The waste lands in the eastern part of the county, which are but of small extent, have generally a deep black peaty soil, and the Abberley and Witley hills have a strong wet clay resting upon limestone.

No agricultural report of Worcestershire has, we believe, appeared in the "Journal of the Royal Agricultural Society," or at least not recently. Lacking this guide, we are obliged to go to sources for information on the subject which are not very modern. If, however, we enter but little into detail, but merely sketch the outline of farm practice according to such authorities and information as we possess, we venture to state that no grave errors will be committed.

"The soil and climate of Worcestershire," says Mr. Lewes, in his History, being "well adapted to the production of every kind of grain in abundance, the agriculture of the county is less characteristic than that of any other in England. The amount of arable land is estimated at 360,000 acres: the crops most generally cultivated are, wheat, barley, oats, beans, peas, vetches, turnips, hops. The wheat occupies annually 43,500 acres. Nearly 1,000 acres in the sandy part of the county are annually down with rye; much of the produce of which is sold to be sown as early spring food for sheep. Barley is sown after turnips on all lands where the latter crop is grown, in conjunction with clover and grass seed, and is calculated to occupy about 33,000 acres annually. Oats are grown on a small scale, and occupy the poorer soils; beans are cultivated on the heavy soils; peas are little used; vetches are in common cultivation as green food for horses. Turnips are extensively and successfully grown on the more friable soils, together with cabbages. "The lands of Wolverley" are famous for their produce of carrots and carrot seed; an average crop is about 15 tons per acre, and the crop finds a ready market in Birmingham, Stourbridge, and the populous parts of Staffordshire. Potatoes are grown very largely, and sent to the same places. The deep rich loam and peaty soils—altogether comprising about 6,000 acres—are annually occupied by the hop plant, the "red, green, and white," being the sorts usually encouraged. Many hop-grounds on the banks of the Tems receive occasional irrigation from the overflow of that river.

The extensive vales, particularly that of the Severn, consists of meadows and pastures of a particularly rich

quality, maintaining their verdure nearly all the year, and occupying an extent of about 50,000 acres. Almost any amount of this land may be mown at pleasure, and a great quantity of hay is sent to the mining districts of Shropshire and Staffordshire. There are, besides, nearly 50,000 acres of upland pasture, including parks and pleasure grounds. Artificial irrigation is not much practised, but the natural meadows derive nearly all their fertility from the overflow of the rivers which traverse them. This county has for many centuries been famous for its orchards, which flourish to a degree unknown in most other parts of the kingdom. They are situated chiefly around the towns, villages, and farm-houses, of the middle, southern, and western parts of the county, where the various kinds of fruit trees are also frequently dispersed in the hedge-rows, and form an important source of profit, though their produce is very uncertain. The manufacture of perry and cider is carried on to a very large extent. Concerning this fact some antique writer of verses in black letter did in his day perpetrate the following, which like much versification of our day would have looked better in prose than in rhyme:—

"In the county of Canterbury most fish is;
And most chase of wild beast about Salisbury I wis;
At London ships most, and wine at Winchester;
At Hertford sheep and ore, fruit at Worcester."

Great light has been thrown upon the adaptation of soils to particular plants; and it is now easy to account for the predilection, so to speak, of the apple-tree for soils that abound in clays and marls. All deciduous trees require a considerable portion of potash for the elaboration of their juices in the leaves, and are prosperous or otherwise in proportion to the plentiful or scanty supply of that substance in the soil. Liebig has shown that "acids generated in plants are always in union with alkaline or earthy bases, and cannot be produced without their presence. The positions generally held by orchards prove this theory to be correct, for they are to be found upon the marls of the old red sandstone of Herefordshire; those of the new red sandstone; the marly clays of the lias; and the calcareous and often marly beds of the inferior oolite in the counties of Worcester, Gloucester, Somerset, and Devon.

With respect to cattle, Worcestershire is not celebrated for any particular breed. The pastures in summer and the yards in winter are furnished by the surrounding counties. There is, perhaps, a waste-land breed of sheep a little peculiar, which are without horns, and are supposed to have sprung from the same stock as the South-down sheep, and the Cannock-heath sheep of Staffordshire. In the enclosures are found the Cotswolds (which also occupy the southern wastes), the Ryeland, the Leicester, the Southdown, and various other breeds or mixtures. The pigs are generally of a large white slouch-eared kind, and a great deal of bacon is made. Few horses are bred; a strong black breed being the sort most commonly used.

Near the principal towns are to be found very considerable horticultural tracts, particularly on the north-eastern side of Worcester, and the northern side of Evesham. Bath, Bristol, and Birmingham depend for their vegetables upon these gardens. Near Evesham are three hundred acres of garden ground.

Worcester stands on a gentle slope on the east bank of the Severn. It is sheltered on the east by a fine wooded hill, and on all other sides is open to the great plain. By means of the Oxford, Worcester, and Wolverhampton Railway, it is placed, together with the most important towns in the county, in communication with the principal places in the kingdom. It is not large: the population is but 27,528; but houses are quickly springing up, trade is brisk, and there is every reason to anticipate a great in-

crease. The glove and china manufacturers employ a great number of people.

The city boasts a great antiquity. In the time of the Ancient Britons it was called *Caer Guorangon*. It was important, doubtless, as protecting the passage of the Severn. In the middle ages it was fortified, and some vestiges of the strong wall yet remain, and certain parts of the city still retain the names of the six strong gates which gave entrance to it, namely, Fore Gate, Water Gate, St. Martin's Gate, Friar Gate, Sidbury Gate, and Frog Gate. During the civil wars in the reign of Charles I., Worcester was the first city which embraced the royal cause. It afterwards fell into the hands of the Parliamentary forces, but notwithstanding the fines and the garrison, it still remained favourable to the royal cause, and in 1651 the gates were opened to a Scottish army, under Charles II. With an army of 30,000 men Cromwell fell upon the city, and attacking it on all sides, broke in upon the disordered royalists, and the whole Scottish army were either killed or taken prisoners. Carlyle thus describes the scene, and I give his quaint summary because it will enable some who are interested in the matter to realize the exciting event: "As stiff a contest, for four or five hours, as ever I have seen. But it avails not. Through Sudbury Gate on Cromwell's side, through St. John's suburb, and over Severn Bridge, or Fleetwood's, the Scots are driven in again to Worcester streets; desperately struggling and recoiling, are driven through Worcester streets, to the north end of the city, and terminate there, a distracted mass of ruin—the foot all killed or taken, the horse all scattered in flight to some place of refuge very far. His Sacred Majesty escaped, by royal oaks, or other miraculous appliances, well-known to mankind; but fourteen thousand other men, sacred too, after a sort, though not Majesties, did not escape. One could weep at such a death for brave men in such a cause. This was Cromwell's "crowning mercy." From Charles the city received the honourable motto—

"*Civitas in bello et in pace fidelis,*"

and from this circumstance is derived the appellation it continues to bear—"the faithful city."

The Saxons built a cathedral in 680, which, being destroyed, was rebuilt in 983 by St. Oswald, and again in 1084 by St. Wulstan. The present building is mixed in its character, possessing some traces of Norman work, but chiefly of the early English and decorative periods. The see enjoys the rare distinction of having numbered such bishops as Latimer, Hooper, Hough, Prideaux, Stillingfleet, and Hurd.

Worcester contains the remains of many religious houses, curious half-timbered buildings, and public edifices. Amongst the latter is the quaint Guildhall, standing in the Foregate. There are also a handsome market hall, county hall, museum, music hall, school of art, an hospital, and an arboretum or public pleasure ground. The hotels are old-fashioned, but full of comfort and good fare, and the ride to the station is but short; and, should the lodgings be full, there are trains constantly running to Cheltenham and Gloucester on the south, to Malvern and Hereford on the south-west, to Evesham and Pershore on the south-east, to Droitwich and Kidderminster on the north, and to Birmingham, an hour's ride, to the north-east of Worcester.

A glance at some of the principal manufactures of the place may be interesting. The porcelain works of Messrs. W. H. Kerr and Co., founded by Dr. Hall in 1751, for the production of fine works of art, should be visited. At first Chinese patterns were reproduced here; then the red, blue, and gold arrangements of colour technically known as "Japanese" work were applied to fictile manufactures. The hard china is made chiefly of Cornish clay, felspar, sand, and silenite; but soft china is composed of bones

calcined and ground, combined with aluminous and other earths, in such proportions that they will vitrify. A visit to the model room, the turning room, and the pressing department will repay any one interested in this class of handiwork. Messrs. Kerr's show-room forms one of the lions of Worcester. Mr. Clune's Vulcan Iron Works and Messrs. Hardy and Patmore's Iron Foundry will afford great pleasure to visitors. In connection with the latter is a splendid moulding department, where cooking ranges and register stoves of all sorts, and lever cheese-presses are cast. A large space of ground is occupied in St. Martin's parish by Messrs. Hill and Evans's British Wine and Vinegar Works. Here an interesting process is conducted—the acetification of alcohol, which consists of nothing more than the absorption of oxygen from the atmosphere, and the addition of the element to the alcohol, transforming it into acetic acid and water. Malt vinegar is here made by mashing the grain in water at 154 deg. Fah., and fermenting the sweet infusion thus obtained in large vats by the aid of yeast, so as to convert the saccharine matter into alcohol. Near these premises an extensive business is carried on in the preservation of vegetables, fruits, &c., by Messrs. Lewis, Watkins, and Co. Their storehouse sometimes contains as many as 18,000 casks of cucumbers in vinegar. A visit to the boiling-house will afford a great amount of information to any one curious in these matters. Those who are interested in floriculture and horticulture must by no means omit a visit to Mr. R. Smith's nurseries at St. John's. The central drive through these grounds, to give an idea of their extent, is one-and-a-quarter miles long. The space occupied in the cultivation of young stock is 80 acres. The glass erections comprise an area of 40,000 square feet. There are eighteen miles of walks. One of the most curious sights of Worcester is Mr. Stallard's wine vaults in Copenhagen-street. This model cellar contains 240 bins of wine, some of the bins holding from 286 to 734 doz.

In the following short summary of the towns of Worcestershire we begin with Malvern, which has a great reputation for baths, hotels, and scenery that will doubtless draw many thither. It is about eight miles from Worcester, and possesses great powers of accommodation, although its population does not reach four thousand. Half the loveliness of Great Malvern cannot be told, and its natural beauties—beauties by the way quite unique—are greatly heightened by the peculiarly grateful and invigorating qualities of the air. It is so different from what residents in other parts of England are accustomed to breathe, that it is with difficulty one can be persuaded that one is sojourning in his native land. The houses are, too, very beautifully built, and with such a charming diversity of taste. Should anybody wish for a pair of wet sheets, nothing is easier: Drs. Gully, Wilson, Grindrod, Marsden, and Walter Johnson will each and all perform the operation with the greatest pleasure. There are libraries, baths, billiard rooms, and antiquities for those who like them. The chalybeate waters are as invigorating to those who require them, as the air is to all who breathe it: it contains iron in a state of *proto-carbonate*, together with a small quantity of *magnesia* and *muriate of soda*.

Droitwich is seven miles from Worcester, whose chief trade arises from the salt springs; and Dudley, twenty-six miles off, which thrives upon the business of smelting and working of iron ore, with which the whole neighbourhood abounds, as well as with coal and limestone. The quarries of Dudley are the most famous in the world for Upper Silurian organisms, shells, corals, and ennerinites of a very numerous genera and species. An inspection of the salt works at Droitwich is very advisable. They supply nearly one one-half of England. Somewhat more than 100,000 tons are annually produced

there, and before the abatement of the tax the duty collected amounted to more than £100 a day. The water from which the salt is made by evaporation is more highly saturated than any other that has been discovered. Researches in the bowels of the earth have shown that a river of salt water, about 22 inches in depth, runs about 250 feet below the surface. Immediately above this subterranean stream is a bed of gypsum, 130 feet thick. When this stratum is penetrated by the borer, the spring rises to the surface, and yields a never-failing supply of salt water. This river flows over a bed of rock salt, the thickness of which has not yet been discovered. The position of the gypsum is somewhat curious; for Bischoff, a great authority in this matter, says that when sea water is evaporated the point of saturation for sulphate of lime is much sooner reached than that for rock salt, and that therefore gypsum must always be deposited before rock salt. This, he concludes, may be the reason why, although the sea contains sixteen times as much salt as it does gypsum, that the latter mineral more frequently occurs than the former as a mineral deposit, though not often in such great masses. Let no one having any spare time return home from Worcestershire without having seen the sparkling splendour of a salt mine well lighted up. It is a subject that will live in the memory.

Evenham is a pretty town 15 miles S.E. from Worcester, which will be ready to offer clean sheets and beautiful scenery to any who may visit it. Kidderminster also, at the same distance, is a fine old market town, once the residence of King Cadur, who is immortalized in the following lines:

"King Cadur saw a pretty maid;
King Cadur would have kissed her;
The damsel slept aside, and said,
King Cadur you have miss'd her."

The carpet manufactories here will quite repay a visit. Stourbridge also will open its houses to visitors—a place noted for iron and glass manufactures, and the fabrication of fire bricks made from the clay of the neighbourhood. This is 23 miles distant; but Stourport, only 12 miles away, and prettily situated at an angle formed by the confluence of the Stour and Severn, is a thriving place, and will give plenty of accommodation to those who desire it. And lastly we come to Bewdley, a quiet clean town with a good malt trade, which is 14 miles distant.

The principal seats in the county are Hagley, occupied by Lord Lyttelton; Witley, by Lord Ward; Hartlebury Castle, by the Bishop of Worcester; Madresfield, by the Earl of Beauchamp; Westwood, by Sir J. Pakington, Bart., M.P.; Ombersley, by Lord Sandys; Hewell Grange, by Lady Windsor; Daylesford (formerly the property of the famous Warren Hastings); Crome, by the Earl of Coventry; and The Rydd, by Sir H. Lechmere, Bart. In closing this list of modern men of note associated with the county, we must not omit one of earlier date—the Marquis of Worcester, who invented and constructed the first actual steam engine, announced in the *Century of Inventions*, in 1663. None of the contrivances before his time were provided with means to make their action continuous. It is fitting, therefore, that his name should not be forgotten at the forthcoming meeting, which will owe so much of its *clat* to this early discovery.

THE STEAM PLOUGH ON PUBLIC TRIAL.

By way of introduction to the Worcester trial-fields, and in order that our readers may rightly appreciate the *status* of steam culture at the approaching great competition of 1863, let us cite some of the main feats hitherto accomplished on such occasions.

Leaving out of view the ponderous steam-horse that used to "astonish the natives" with its lumbering, tumbling "shoes," or "endless-rails," and half-a-dozen ploughs following in its track; and omitting also, all notice of the travelling engine with rotary delver at its tail, which, first in one form and then in another, has from time to time surprised the public by bits of beautiful tillage that, unfortunately, never became anything more extensive than "bits;" and without devoting space to the mention of all the sets of wire-rope apparatus that have appeared at the Royal Meetings, we will just recapitulate a few of the principal facts reported by the Judges concerning one or two of the best steam ploughs now before the world as candidates for public favour.

At the Chelmsford Meeting, in 1856, both Mr. Fowler and Mr. Smith of Woolston competed with machinery on the *stationary-engine* principle. The rate of Mr. Smith's novel process of "smashing-up" with a 7-horse portable steam-engine, was computed by the Judges to be less than 4 acres in 10 hours, costing 8s. per acre for wear and tear, interest of capital, and all expenses. In the adjourned trial at Borted Lodge, Mr. Fowler's engine, working up to 21-horse-power, ploughed well at the rate of 7½ acres in 10 hours, at a total cost of 7s. 2½d. per acre, including interest, wear and tear, and removal (which latter item was reckoned at no less than 17s. 6d., with a half-day lost every third day). This was for work valued at 7s. an acre by horse-labour.

In 1857, the steam-ploughing machinery was *self-*

travelling from field to field (excepting in cases of very steep hills and unduly awkward turnings), and at the same time appeared the system of hauling an implement between a *movable engine* on one headland, and a *self-moving anchorage* on the other. The work done was declared equal in excellence to good horse ploughing; but the unsuitable nature of the ground precluded any satisfactory determination of the economy of performance.

Next year, at Chester, very marked progress was displayed. The Woolston cultivator, with stationary 8-horse portable-engine and windlass, manufactured by Messrs. Howard, broke up and then cross-scarified heavy land at the rate of 8½ acres in 10 hours (for the two operations); the total cost being 14s. per acre, for a condition of tilth that would have cost by horses at least 18s. 6d. Mr. Fowler's movable 10-horse engine and anchorage ploughed light land at the rate of 7½ acres in 10 hours; the total cost being 6s. instead of 8s. per acre as by horses. The same machine ploughed "a strong three-horse soil" 6 in. deep, at the rate of 5 acres in 10 hours, at 9s. 2d., instead of 12s. 6d. per acre as by horses—a saving of nearly 30 per cent. The interest and wear-and-tear were calculated at 20 per cent., divided over 200 days' work in a year; and the Judges affirm that they charged each machine with a *maximum* of working expenses, while crediting it with a *minimum* value for the work performed. Double-ploughing, or trenching 12 inches deep, was executed at the rate of 2½ acres in 10 hours, costing 18s. 4d. per acre; whereas, horse-power could not have performed such perfect tillage at all, and by hand-labour it would have cost £6 13s. 4d. per acre, and yet have been inferior in value to the steam work.

At Warwick, in 1859, Messrs. Howard's Woolston apparatus "smashed up" in grand style a most obdurate

piece of ground at the rate of 7 acres in 10 hours; and Mr. Fowler, with "digging breasts" attached to his three-furrow plough frame, "made a complete fallow of the hardest land at one operation," at the rate of $6\frac{1}{2}$ acres in 10 hours.

So far, *perfection in the quality of the process* had been attained: the point of *economy* was still open to further progress. A more systematic investigation of mechanical merits was instituted by the Society's engineer and judges at Canterbury Meeting, in 1860, bringing out the following important results. In ploughing a strong loam (which, from the ascertained draught of a common plough at 6 cwt., would cost 12s. an acre if turned over by horses), "the least efficient of the competing machines (Beard's) showed a saving in total expense of 15 per cent.; both Robey and Co.'s and Eddington's machines showed a saving of 45 per cent.; and Mr. Fowler's work was done at a saving of no less than 68 per cent.," as compared with the cost by horse teams. Mr. Fowler's 12-horse engine, working with a pressure of 68lbs. on the square inch, drove four "8-horse furrows" at once, at the rate of 11 acres in 10 hours; and the total cost was computed to be 4s. 6d. an acre instead of 12s. (the lowest price by horse labour), though 20 per cent. upon the prime cost of the apparatus was allowed for interest and wear and tear. On the "strong land," where the draught of a single furrow represented the extraordinary traction-force of $7\frac{1}{2}$ horses, Mr. Fowler's machine ploughed up and down a hill having an average inclination of 1 in 10, in one place no less than 1 in $4\frac{1}{2}$; the rate of performance being 6 acres in 10 hours, and the whole expense only 8s. 4d. per acre.

At these trials was also observed the time required for shifting engine and tackle, and "setting down" to a fresh field; *about three-quarters of an hour elapsing between getting steam up to the pressure in one field and commencing tillage in another.* This was a vast advance upon the "lost half-day" in 1856; and the engine being able to steam its own way from place to place, without the 6 or 8 horses previously needed, lowered the *cost of removal to 4s., instead of 17s. 6d.*

The prolonged Leeds trials in 1861 yielded a judges' report full of tabulated data and results. The principal facts were as follows. Mr. Fowler's 12-horse engine scarified at the rate of $6\frac{1}{2}$ acres in 10 hours, at a total cost of 7s. 2d. per acre, the depth being 7 inches, and the soil very strong and stubborn. Messrs. Howards' 10-horse engine scarified the same soil $5\frac{1}{2}$ inches deep, at the rate of $6\frac{1}{2}$ acres in 10 hours, at a cost of 6s. 8d. per acre. It is impossible to place a money value upon this scarifying of whole ground into a deeply-pulverized seed-bed at one operation, the bottom cleanly cut, the soil broken, and left light as by the spade; and further powdered and levelled, without the trampling of a horse, by a harrow hung loosely to one side of the grubbing or digging implement. The immense superiority of the tillage to any horse-work whatever was even more gratifying than the excellence of the regular turnover ploughing performed by the two most closely competing sets of apparatus. In the "heavy land" field, to plough a single furrow 8 inches deep required a draught equivalent to the power of five horses, yet Mr. Fowler's machine ploughed at that depth, at the rate of $5\frac{1}{2}$ acres in 10 hours, for the total cost of 7s. 10d. an acre. The most remarkable performance, however, was that of Mr. Fowler's stationary 8-horse engine and windlass, which ploughed a clover ley 6 inches deep, at the rate of $7\frac{1}{2}$ acres in ten hours, the whole cost being 5s. 2d. per acre. The judges omitted from their calculations the expense of removal; but it was noted that while a "self-propelling" apparatus was "set down" and "loaded up again" ready for travelling for *4d. per acre*, machinery demanding the assistance of four to six horses cost *9d. an acre* for the same items of preparation for work.

The Farningham exhibition last year gave us no judges' investigation of the capabilities of the steam-ploughs, but private observations made at the time are entirely at variance with the official announcement that the "cost of working, deduced from experiments at Boxted Lodge in 1856, is not now far from the truth." We have the authority of our own reporter (in the *Mark Lane Express* of that period) for the following statements. Messrs. Howards' stationary 10-horse engine, at 70lbs. pressure, ploughed at the rate of about $7\frac{1}{2}$ acres in 10 hours, and Mr. Fowler's moveable 14-horse engine, at 40 to 50 lbs. pressure, ploughed at the rate of about 9 acres in 10 hours. This was fair 8-horse work for a single furrow (as apparent from the depth and from the character of the land), worth at least 10s. per acre by the horse-plough, and estimating the expenses by the table in the Leeds report, the cost was from 6s. down to 5s. per acre. Mr. Fowler's moveable 10-horse engine, at 60 to 70 lbs. pressure, also accomplished $7\frac{1}{2}$ -inch deep "digging," at the rate of about 12 acres in 10 hours, the cost probably under 4s. an acre; and his 14-horse engine scarified at the rate of about 80 acres in 10 hours, at a total expense of less than 2s. per acre—up to that time an unprecedented feat in steam-cultivation. One lesson of the Leeds trials had been that *very considerable motive power was economized by efficiently carrying the wire rope clear off the ground.* An experiment there made showed that the draught of a length of rope trailing along the land was ten times greater than when the same rope ran over rope-porters, holding it clear of the ground; and accordingly, at Farningham, Messrs. Howard, as well as Mr. Fowler, appeared with *mechanism for tightening and upholding the "slack" rope.*

Of the Yorkshire Agricultural Society's steam cultivation trials in August, 1862, Mr. J. C. Morton furnished a very comprehensive report, from which we glean the following main points. On a foul clover stubble, in light sandy soil (a small part hard clay), Mr. Fowler's single-cylinder 8-horse engine, working at probably 70lbs. pressure, ploughed 5 inches deep, at the rate of 10 acres in 10 hours. Where the proportion of clay was somewhat greater, Messrs. Howards' double-cylinder 10-horse power engine, at 70lbs. pressure, ploughed full 5 inches deep, at the rate of $7\frac{1}{2}$ acres for 10 hours.

A new method of comparing the work made by cultivators or scarifiers was tried on this occasion. A frame, 4 feet by $4\frac{1}{2}$ feet, inclosing an area of 2 square yards, was dropped here and there upon the several plots of work done, and the loose earth within the frame carefully collected and weighed. Messrs. Howards' 10-horse engine moved 860 tons' weight per acre, at the rate of one acre, or 660 tons, per hour. Mr. Fowler's 14-horse engine moved 650 tons per acre, at the rate of $1\frac{1}{2}$ acres, or 1,240 tons per hour, the daily work $18\frac{1}{2}$ acres. Though the weight moved per acre was less than in Messrs. Howards' case, Mr. Morton observes that the soil was completely tossed about by the high speed of the implement; whereas the Bedford cultivator merely moved what it broke up, so that a crossing would be required to make its tillage equal to that of the former. In fact, the weight of loosened earth per square yard or acre is a test of the *depth of work*, but by no means of the efficiency of the mechanical action to which the ground has been subjected.

In May and June last, Messrs. J. C. Morton and J. T. Harrison, C.E., conducted a series of dynamometer experiments with the Woolston, Leeds, and Bedford machinery. Their report having been but recently published in our columns, a word or two here will be sufficient. The circumstances of the trial can hardly enable us to draw a just comparison between the several machines. The Woolston tackle was not new, and was worked with comparatively few rope-porters. It does not appear, from the experiments with the Bedford tackle, how much of

the draught of the slack-rope is returned again without loss to the pulling-rope, by means of the "compensating pulley" on the double snatch-block. The data respecting the Leeds tackle seem ample enough, with one exception—the friction due to the anchorage pulley when the whole strain is on the rope was not ascertained. It is very remarkable that only three-quarters of a hundredweight

draught was needed in order to move 700 yards length of rope passing round and distended between the engine clip-drum and the anchorage pulley, and carried clear off the ground upon rope-ports. As one cwt. draught, at a speed of $8\frac{1}{2}$ miles per hour, represents 1-horse power, the waste of motive power between the engine and the implement is, therefore, very small indeed.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MEETING AT WORCESTER.

THE IMPLEMENT TRIALS.

The yard was opened for the accommodation of that small portion of the public desirous of viewing the method of conducting these experiments on Wednesday morning, July 15. The weather was charming, quite equal to the situation, which is perfectly beautiful. Instead of the yard being low, as has so usually been the case, it is now situated on the slope of a hill, which commands a glorious prospect of rich country, bounded by the Malvern hills. It is upon the land lying between the London and Bath roads, and is approached by a private occupation road branching from the London road. About forty-six acres have been enclosed by Messrs. Manning, the contractors; and Mr. Brandreth Gibbs reigns supreme over the arrangements in this space with judgment and good taste, that have grown with his successes—successes that should each be celebrated by a medal with the name of the meeting it commemorates. Portions of the farms of Mr. William Coney and Mr. Peter Foxwell have been taken to form this yard. The form of the enclosure resembles the rudder of a ship. The entrances are in the shoulder of the figure, and its head and neck, for a considerable way down, is given up to machinery in motion. The middle of the figure is allotted to implements not yet exposed to view; and the thick end to the cattle, the horse-boxes and ring being at the very base. Within a little space of the heel of the figure runs the railway, with a siding or tramway connected right into the yard.

In addition to the show-yard itself, the committee have secured various other pieces of land in its immediate neighbourhood, for exhibition of implements on the days of the show, and others at a distance for the more special trials of this week. Fifty acres have been obtained of Mr. Wm. Coney, Middle Batterhall Farm, and fifty-six of Mr. Pitcher, of the Nunnery Farm, besides some stiffer stuff at a distance of six miles, for the stiffer trials which await those who make a successful passage through the preliminary ones.

The stewards of departments are as follows: Messrs. Paine, Milward, and Dent, M.P., for live stock; Sir Archibald Macdonald, Bart., Sir Edward Kerrison, Bart., M.P., Mr. Torr, and Mr. J. H. Arkwright (steward elect) for implements.

The trials of steam engines and threshing machines commenced late on Wednesday afternoon, and have continued uninterruptedly until this afternoon (Saturday), under the patient and intelligent direction of the following able judges: Messrs. J. B. Gooch (late of the Eastern Counties Railway), D. K. Clarke (late director of the machinery-in-motion department in the International Exhibition), T. Stewart (engineer of the Midland locomotive department), for the engines, with Mr. J. Easton, of Easton and Amos, engineers, Southwark; and Messrs. Chalcraft, Hicken (of Rugby), and Martin, for the threshing machines, with Mr. Amos, jun., to assist them.

This trial of engines is very important: much depends on it; for, although a thorough report by the judges, stating the reasons for the decisions they give, may in a great measure tend to qualify the situations of the beaten, by showing that perhaps between the prize machine and its uncertificated rival there is but little difference, the reception of the prize is a great thing, commercially speaking, for the fortunate winner of it. If the prizemen of a former year lose their laurels here, they are certain to find the fact reflected in a very disagreeable way in their half-yearly balance-sheet. With the consciousness of a large stake in the issue, some exhibitors are dragged up to the "scratch" with evident signs of reluctance; and those which cannot avoid the race enter upon it with great trepidation, and depart from it, when at an end, with feelings of relief. It is truly amusing to watch the dodges of the drivers to lower the draught, to generate a constant quantity of steam, and to feed the voracious fire with choice fragments of coal at short intervals; they watch each other, and are watched by the judges, with a keenness that defies unfair dealing.

The fixed engines are 18 in number; the portable number 51. The former are exhibited by Messrs. Clayton and Shuttleworth; Hancock, Barrows, Marsden, Ellis and Sons, Brown and Co., Radcliffe, Johnson, Tuxford, Parsons; Barrett, Exall and Andrews, Hornsby, Ferrabee, Blaylock and Pratchitt, Haywood, Carter, Shanks, Whitaker, and Childs. The latter are exhibited by Messrs. Goucher, Robey, Hayes, Corbett, Ashby and Co., Child, Gilbert, Maynard, Gibbons, Hayward, Clayton and Shuttleworth, Underhill, Parsons, Burrows and Co., Brown and May, Wallis and Haslam, Warren, Holmes and Co., Williams, Smith Brothers, Barrett, Exall and Andrews, Barrows and Co., Hornsby, Humphreys, Sykes, Richardson, Foster, Savory, Parsons, Blaylock and Pratchett, Allchin and Co., Bruckshaw, Ellis and Son, Tuxford and Sons, Marshall and Son, Lee and Co., Turner, Nalder and Nalder, Richmond and Chandler, Smith (Woolston), Woods and Cockedge, Mellard, Pickaley and Sims, Johnson and Whittaker, Tasker and Sons, Warner and Son, Crosskill (Trustees), Stevens, Aveling and Porter, Bradford, Loomes.

The prizes offered are as follows: For fixed steam engines, £40, for boilers to fixed steam engines, not exceeding 12-horse power. Those for portable engines are, first, £25 above 8-horse power, and £25 for the class not exceeding 8-horse power. The conditions upon which these prizes are offered are such as to secure good mechanical arrangements and durability of construction. In the other department are three prizes for hand-dressing machines; two, the one for £50 the other for £30 finishing machines; and one for barley-hummellers.

The trials opened with Clayton and Shuttleworth's 10-horse power fixed engine. On Thursday it continued without showing much superiority, if any, to

the running at Carlisle and Chester. It was only concluded on that day by lamp-light at ten o'clock at night. On Friday the running was also commenced early, and continued late. I give the results now, so far as I obtained them up to noon on Friday. Toward the end of my report I shall have others to append. I must warn my readers, however, before I give these figures, that they must be used with *the utmost caution*, as forming only one element upon which the decisions of the judges will be built. Price and general construction are the elements of which I now take no account.

FIXED ENGINES.

Clayton and Shuttleworth	2 hours 48 min.
Barrett, Exall, and Andrewes	2 " 51.8 "
Hornsby	2 " 28 "

These are all 10-horse power engines.

PORTABLE ENGINES.

Robey	1 hour 8½ min.
Gibbons	1 " 16½ "
Clayton and Shuttleworth	3 " 28 "
Richards and Watts (Childs)	1 " 10 "
Brown and May	2 " 34 "
Barrett, Exall, and Andrewes	3 " 41½ "
Holmes and Son	2 " 14½ "
Tuxford and Sons	3 " 53½ "
Ruston and Proctor	1 " 18 "

Hornsby's engine being unable to keep the weight on the brake suspended, was withdrawn.

All 8-horse power.

Clayton and Shuttleworth, 12-horse power	8 " 87 "
Hornsby	8 " 41 "
Tuxford and Sons	8 " 2½ "
Barrett and Exall	8 " 1 "

Fourteen pounds of coal are weighed out to each competitor per horse-power, and according to the *mechanical* time during which the engine will sustain a given weight at a certain fixed height is the result.

As to the thrashing machines, I believe a selection of about twenty-five was made from seventy or eighty entered for trial. The general headings under which points are given, beyond price and construction, are—state of straw, state of grain, perfect separation of grain from straw and chaff, separation of the different sorts of chaff, seeds, &c., and power expended. The power expended is read off from the index of a dynamometer, situated between the engine and the machine, fitted with two pulleys of equal size. The machines are allowed fifteen sheaves to prepare for work, and then one hundred sheaves of wheat, together with a little barley. I hope at the end of this report to state results; now I can only furnish the names of those exhibitors whose machines were tried:—

Bruckshaw	Robey
Burrow	Wallis and Haslam
Barratt, Exall, and Andrewes	Barrows
Tuxford and Sons	Hornsby (two machines)
Turner	Clayton and Shuttleworth
Gilbert	Nalder and Nalder
Underhills (two machines)	Gibbons
Tasker	Parsons
	Humphreys.

A further process of selection is now going on, and it is probable that the run between the leaders of the preliminary race will not occur till Monday.

The prizes offered for the competing exhibitors of steam ploughing and cultivating apparatus are as follows:

1st. The Gold Medal and £50 for the best application of steam power, for the cultivation of the soil.

2nd. Fifty pounds for the best application of steam power, which may be effectively and safely adapted for small occupations.

The preliminary canter occurred on Wednesday, in a small field of clover-lea on the Nunnery Farm. Part of the field had been vetch and fed off. It was a strong loam rendered stronger by being deprived of its moisture. There were eight candidates. Messrs. Hayes, of Stoney Stratford, with steam-break windlass and Fowler's plough; Smith of Woolston, with his three-time implement and ten-horse power engine; Steevens (Hammeramith) with his plough driven by Garrett's engine and Howard's windlass; Savory, of Gloucester, with his two engines and Fowler's four-furrow plough; Howard with three-time cultivator; Fowler with disc anchor, windlass, and portable engine; and Coleman with his self-propelling engine and windlass beneath the boiler. The engines were all of one nominal power. No account was taken of coal, nor much of time. The judges, Messrs. H. B. Caldwell, C. S. Read, Jacob Wilson, of Newcastle, assisted by Mr. William Owen, as engineer, were all at their post in time, and the running began soon after nine o'clock. Savory amazed folks with the speed of his movements, and the plough literally flew along from one engine to another; and when one could catch a glimpse of the steersman seated on the plough, he looked like a very material deity, seated upon a dun-coloured cloud. The pace is too great, however, and it would be better if he diminished that by one-third and increased the width of his implement. It is impossible for a man to steer correctly under such circumstances. If the plough encountered any obstacle, the breakage would be serious to the tackle and the rider. I doubt very much whether it is advisable to exceed three miles per hour; and Fowler's plough, under this new matter, was running at the rate of rather more than four miles an hour. Still it must be admitted that the apparatus is most useful. It appears to have arisen out of the experience of the Gloucester Steam Ploughing Company. They found that in order to work for hire two engines were necessary, and engines that could travel from place to place like this one, without horses, which Savory's do. These engines coil up the rope required upon the large cylinders which surround their boilers, and have only the implement to carry with them. No sooner do they stop work than they are ready to move to another field: and no sooner do they take up their position on the opposing headlands than the ropes are thrown out and work begins—no bother about anchors, &c. The distance from the second to the third trial field was about half a mile, and while other competitors were an hour and a-half and more, Savory was only 25 minutes in leaving the one and getting to work in the other. For hire work no doubt can exist that this is the best mode; but not for tenant-farmers, for very few men have sufficient work for two engines the year round. For companies, such as the Steam Cultivation Company, and a few very large holders, such a plan is the very one which must commend itself to the judgment, provided some reduction is made in the speed. On Thursday, Smith, Savory, Fowler, Howard, and Coleman, got to work at about nine o'clock. Steevens also took up a position, but did not start; and Coleman, though he started, soon smashed his cultivator, and could not proceed: he was making very good work indeed when this untoward accident occurred, as he had done the previous day. About two acres were allotted to each exhibitor, coal was weighed out, and time was taken. The trial was understood to be for the prize No. 2, of apparatus suited to small occupations. I transcribe particulars from my notebook as follows:

Fowler used his small set, viz., ten-horse-power portable

engine, disc-anchor, windlass, and five-tine cultivator; his depth 7 inches; running-time, 1 hour 57 minutes; coal 3 cwt. 1 qr. 2 lb.; time expended in moving out of the first field into the second (not quite half a mile) 55 minutes; 8 horses, 4 men, and 3 boys employed.

Howard.—Ten-horse-power double cylinder portable engine, 3-tined cultivator; depth, 7 inches; running-time, 1 h. 57 m.; coal, 3 cwt. 1 qr. 19 lb.; time expended in moving the second field and setting down, one hour and thirty minutes: eight horses and the usual complement of men engaged in moving.

Savory moved into the field No. 2 from No. 1 without the aid of horses, and with three men and one lad, and set down in twenty-five minutes. The time running one hour forty-one minutes, depth seven inches, coal 5 cwt. 1 qr. 10 lbs. The apparatus employed consisted of two ten-horse engines, one on each headland, pulling a Howard's three-tined cultivator between them. The price, with Fowler's plough and Howard's cultivator, £1,086.

Smith of Woolston moved from one field to another (half mile), and set down in sixty minutes, and employed eight horses and his usual staff of men in doing it. The time occupied in "smashing" the two acres was three hours and one minute; the amount of coal consumed 3 cwt. 3 qrs. 21 lbs. The apparatus consisted of ten-horse engine and three-tine cultivator.

The surface to be ruptured had borne two crops—one of grass, apparently an old lea; the other of vetches, fed off. Howard, Coleman, and Fowler were called upon to work exclusively amongst the tough, matted roots of the clover: Smith and Savory had about one-third of grass, and the remainder of vetch stubble, which required less power to break it up.

With respect to work, Fowler's was deep and good as a whole, although in certain places imperfect steerage was evident in the spaces which were left unmoved. *Howard's* work was finer than Fowler's, as well bottomed, but suffered from the wheel-tracks, in the estimation of several observers. Savory's was badly done; and Smith, who had taken a long time to do his plot, had been working with a low pressure and great care, and had accomplished a decidedly good result. There was some ploughing and digging done after this by Howard, Fowler, and Savory. The digging was wonderful, and all that could be desired for autumn work.

I have as yet made no mention of Collinson Hall, save to describe his rope; but as he entered into none of the trials, and exhibited merely to show the long link iron rope with its sheaves, nothing more is perhaps necessary. It is a pity were the meeting to close, however, without some experiments being made with this rope to ascertain the power absorbed in its friction upon the ground, which is generally considered to be very great. As to the question of durability, that can only be solved by time. I must not also omit a reference to that really important implement of Mr. Smith's—his combined scarifier drill, which, though it did work of little value on the hard surface where it was tried on Thursday, has during the past winter and spring proved its excellence upon several farms in Buckinghamshire and Huntingdonshire.

In the trial field on the Friday Messrs. Coleman's steam-cultivator again met with an accident in attempting too great a depth in a stubborn soil, but afterwards made some capital work. The ground was light sand at one end, and strong indurated clay at the other; so that implements which worked well at one part of their journey cut a poor figure on the remainder, owing to the unsuitableness of one form of share to such diverse qualities of soil. Mr. Smith, of Woolston, with a ten-horse engine, grubbed six inches deep 1 acre 3 roods and 16 perches in 2 hours 58 minutes, burning 3 cwt. and 28 lbs. of coal.

Messrs. Savory, with two engines, grubbed 1 a. 8 r. 28 p. in 1 hour 57 minutes, with 5 cwt. 26 lbs. of coal; the depth very unequal, owing to the excessive speed travelled. Mr. Fowler, with a 14-horse power engine, grubbed 6 inches deep on the sand and 9 or 10 inches deep on the clay, 1 acre 8 roods 17 perches, in 1 hour and 44 minutes, consuming 4 cwt. and 28 lbs. of coal. Messrs. Howard, with a 10-horse engine, grubbed 7 inches deep on the sand, and 10 to 11 inches deep on the clay, 1 acre 8 roods 6 perches, in 2 hours and 9 minutes, burning 4 cwt. 1 qr. 28 lbs. of coal. Mr. Fowler, with two 12-horse engines, and his digging implement, did some extraordinary work, proving the immense power of the tool in breaking up huge masses, and tossing them in all directions, the performance being 1 acre 8 roods 28 perches, in 2 hours and 38 minutes, with 5 cwt. of coal.

Mr. Steeven's plough, after pulling up anchors, and making several stoppages, was tried by Mr. Savory's engine, making very good work.

To these balanced frames, plough-bodies, cultivating tines, or any other form of tillage implements, can be attached; and Mr. Steevens has harrow-frames taking no less than 12 feet breadth, which he attaches underneath the plough frame, making this truly a universal implement for the farmer. It was deservedly awarded a Silver Medal, while the Hammersmith plough has the further honour of being purchased for her Majesty's farm at Osborne. A dynamometer experiment seemed to show, in spite of the irregularities and jerkings, that Messrs. Howard's cultivator with three tines, and Mr. Fowler's cultivator with four tines, took about equal draught; but the average depth of the work in the two cases was exceedingly difficult to ascertain. In fact, it is only in smooth turn-over ploughing that a fair comparison of draughts can be made.

On the Saturday, at Wadborough, the work in a piece of old sward, hard-baked, with gaping fissures in every direction, was tremendous. Messrs. Smith, Howard, and Fowler, with two sets of apparatus, did their best to throw up the ground into masses, lying in all postures, and useless for any after tillage until one or two seasons have passed over it. Only the "digging" shares and breasts could really tumble the whole soil over, the cultivating tines leaving too much flat, no matter how it might be cut or broken. Finally, Mr. Fowler's machine came to grief, as others had done; a flange of one winding drum was fractured, and the trial closed with cultivation that proved nothing beyond the relative powers of endurance of the different machines in processes they would never be called upon to perform.

The principal results, with the awards of the chief prizes, were given in our telegraphic news direct from the trial yard as published last week, so that our report of the trials may here close; but one circumstance of great moment must not be omitted. Whether rightly or wrongly, the public have a general belief that the "racing" engines of the Society's trials are specially got up with a view of getting the extremest amount of duty out of a given weight of fuel, under the management of most practised and expert firemen, regardless of other considerations; though of course complying, of necessity, with the Society's regulations as to construction of the boiler, tubes, &c. In order to prove whether the "racers" really do differ from the ordinary commercial engines of the same makers, the judges ordered out such engines for trial, that the respective performances might be compared. The makers strongly protested against such a proceeding, without previous notice having been given; and the stewards, taking into consideration the different way in which the makers had understood the wording of the Society's instructions to the judges (giving them full power to try any engine on pain of exclusion from the show-yard), put a stopper upon what might have been a very enlightening

set of experiments, and have guarded the public against a means of imposition, if such there be, on a rather extensive scale. As it is, the public will naturally ask if the engine manufacturers are afraid of coming up to the brake? Do they fear an exposure of some tricks of trade, knowing that the common engine they supply to the farmer possesses far less power than the racing engine which he is led to believe is a faithful sample? The answer probably is that the great makers would be perfectly willing to submit under equal terms. If all showed two classes of engines—racers, and such as will last—the judges might test one of each sort, and the public be the wiser for any ascertained discrepancy of results between the two; but, as some makers may have none but their racing engine in the yard, while others have other engines besides this racer, the proposed testing would place one man in a more invidious position than another.

We should add that, while some makers admit the fact of their bringing a racing engine to these competitions—that is, an engine with a boiler having several more tubes than is the case in their ordinary commercial article, and take care to have well “run the friction off”—other manufacturers object to the term “racer” altogether, and, in support of their objection, produce a printed history of their prize engine of years back, showing what hard work it has been doing to the satisfaction of the purchaser ever since its great feat on the Society's brake.

THE IMPLEMENT YARD.

An object of considerable interest in the yard is the trial-bed in which the steam-engines were put through their paces.

One, though perhaps not the principal, element in the excellence of a steam-engine, consists in the power it gives out in proportion to the fuel consumed. The contrivance by which the power of the steam-engine is determined is of beautiful simplicity yet of remarkable ingenuity. The investigation to be made is, how much work can the engine under trial accomplish with the consumption of a certain weight of fuel? The engine-driver may break-up his coal into fine pieces, he may feed it to the furnace in small quantities at a time, quickly introducing it, and lastly closing the fire-door to prevent the ingress of cold air above the glowing coal; the supply of air through the ash-pan, and of water to the boiler, may be so carefully and judiciously managed and controlled, that an even temperature of the boiling water is preserved, and the pressure of steam never falls below the standard, or rises so high as to exceed it. But how are we to measure the force that the engine gives out? Mechanical power is expressed by the number of pounds raised a certain number of feet in a given time; that is, the three elements of weight, distance, and time must be considered in a determination of the amount of force in action. It would be possible to set an engine to the hauling of a load out of a mine-shaft or up to the top of a steeple or a chimney; and the engine that raised a given weight to the greatest height by burning a certain amount of coal would produce most power from the fuel. But a more convenient apparatus is necessary; and instead of lifting a load, the engine may overcome the friction of two rubbing surfaces, provided we can measure the amount of that friction with accuracy. For this purpose is employed the force-resister or friction-brake. The engine-belt is made to drive a smooth fly-wheel, which has a brake upon it, screwed to any tightness that may be necessary to hold the point of suspension of the weight (see fig. 1) at same height as the centre. It is evident that as much power will be needed to hold up the weight while the wheel revolves within the brake-ring, as to keep lifting the weight at the velocity of the wheel periphery. The weight is so adjusted to the size and velocity of the engine fly-wheel, that every alleged horse-power shall have to overcome friction equivalent to raising

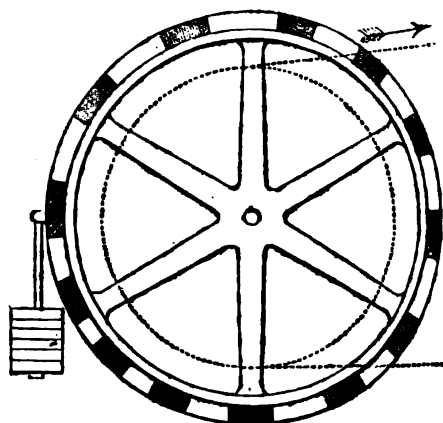


Fig. 1.

33,000 lbs. one foot high per minute; 14 lbs. of coal for each horse-power are served out to the engine-driver, and of course the engine that can run longest, with its due load of work on, gets the most power out of the fuel.

In trying the thrashing-machines, one subject of investigation is the power required to drive them. To measure the force applied to hauling an implement is easy—you have simply to ascertain the number of stones or pounds draught, by means of a spring. To find the draught of an engine driving-belt is a more complicated matter. Figures 2 and 3 give an idea of the rotary dynamometer

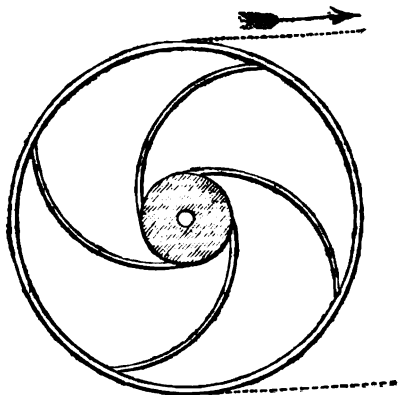


Fig. 2.

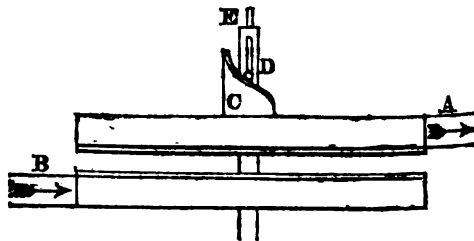


Fig. 3.

of Messrs. Weston and Ames. The engine-belt (A) drives a rigger or band-wheel, hung loosely upon the axis of another rigger, from which a belt passes to the drum-sheave of the thrashing-machine. The wheel A has springs for arms or spokes, which are fast upon the axis of wheel B, and of course the amount of compression of the springs by the

pulling of the engine-strap in one direction, and of the machine-strap in the other, is measured by the partial rotation of the wheel A in advance of wheel B. An inclined cam, or screw (C), registers the extent of this difference in the position of the two wheels, by causing a pin to project, more or less, from the end of the axis, and this again is made to influence the number by which a complicated piece of clock-work expresses the amount of power so ascertained.

The performances of the steam cultivators have been recorded; of the apparatus itself we can give a better notion by pictures than by letter-press, selecting some of the principal features by which each inventor's machinery is distinguished.

Mr. Fowler exhibits three entirely distinct systems of working traction-implements. His arrangement for working a portable engine has been improved since last year. Fig. 4 represents the windlass, which

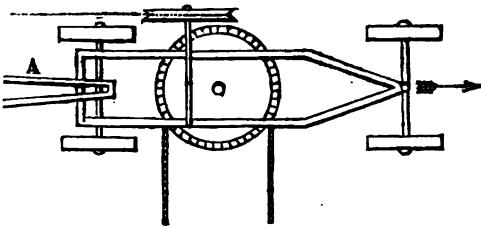


Fig. 4.

travels on the headland in advance of the engine, which is hung behind it by a pair of iron shafts (A), a driving-chain from a grooved rigger on the engine crank-shaft drives the rigger (B), from which reducing gear conveys motion to the clip-drum. Fig. 5 is an elevation of the chain, made of wedge-shaped blocks of



Fig. 5.



Fig. 6.

hard wood, linked together by iron pieces; and Fig. 6 shows one of the blocks in the V groove of the rigger. No slip is perceptible, no matter how loose the chain may hang, or in what relative position the two riggers may be; and there is every reason to expect the chain to wear for a very long time.

Mr. Fowler's old and still his distinctive and principal plan of an engine and anchorage is seen in fig. 7, the clip-

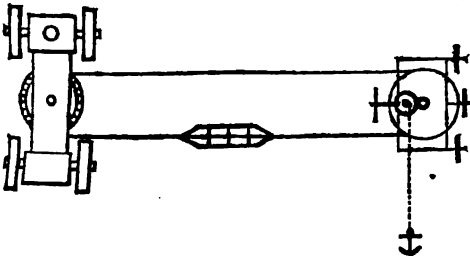


Fig. 7.

drum being placed underneath the boiler. It should be observed that when the length of furrow varies, spare rope is carried upon the plough; and for awkward corners a claw-anchor and snatch-block are brought into requisition. But Mr. Fowler has also brought out a set with two engines, specially adapted for performing work for hire. The implement A (fig. 8) traverses to and fro between

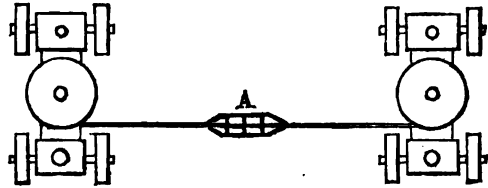


Fig. 8.

two engines, each with a common winding drum underneath, and a very simple and most ingenious contrivance for regulating the coiling of the rope, and for applying a small brake action to the drum when paying out the slack. Only a single line of rope extends across the field, and this, of course, cannot be held upon high porters so as to be entirely clear of the ground. One advantage of this set of apparatus is its facility for dealing with fields of very irregular shape, the rope feeding equally well upon the drums at any angle, and no time whatever being lost in adding to or shortening the rope for varying lengths of furrow. No horses are needed to shift the whole tackle from one field to another.

Mr. Hayes' windlass is represented in fig. 9 (D) and (E),

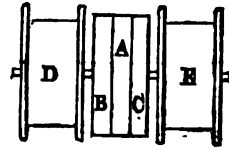


Fig. 9.

being the two winding drums, driven respectively by the riggers (B) and (C), while (A) is a dead rigger between the two. By means of ropes laid round the field for the purpose, the anchor-men stop the windlass at pleasure, without using any signals; and as the motion is reversed by shifting the engine-belt from one rigger to another, no wheels are taken in or out of gear.

Mr. Stevens has a set of the Bedford tackle, manufactured by Messrs. Garrett, and his own new plough, of which fig. 10 will convey some notion. Bell-crank

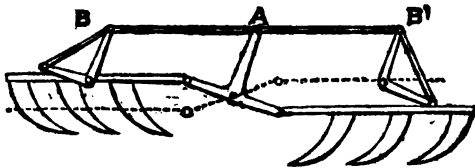


Fig. 10.

levers B B', with a double bell-crank lever A, are united by rods at top, so as to oscillate simultaneously on their centres; hence, when the set of ploughs B is out of work, the other set, B', is in work; and by a movement of the rods and levers, the plough beam-frames are brought into the position indicated by the dotted lines. Plough bodies cultivating tines, or wide harrows are attached at pleasure. And there is a gauge to indicate the depth of the ploughing.

Mr. Smith, of Woolston, has improved his snatch-block,

by making the centre boss, and the pin on which it revolves, deeper, so as to present a greater rubbing surface, and also hold the pulley against oscillation. His combined cultivator and drill (fig. 11) is so altered that we have a difficulty in recognising it at first sight. A frame strong, but not unduly heavy, rests upon a steerage-wheel (A) and a pair of wood-wheels (B), the back part curving up and

supporting the drill-box (C); from a coulter-bar at D a lever frame (D G) is hung, carrying the grubbing tines and seed-coulters, and resting upon a pair of small wheels (E). When the nine coulters (in one rigid frame), are raised by chains on the windlass barrel, the whole machine is balanced upon the wheels B. A marker (F) follows at one side, the bar to which it is hinged being projected side-

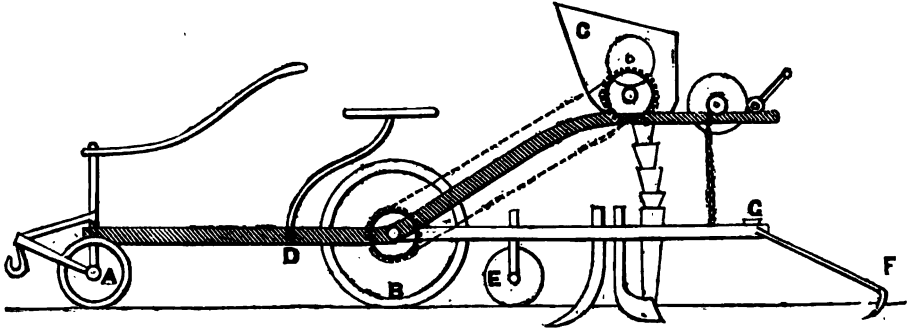


Fig. 11.

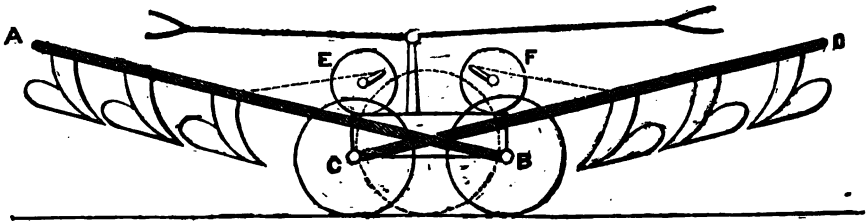


Fig. 12.

ways, or drawn in, to suit varying widths of work. There is a seat for the steerer over the wheels B.

Our next diagram, fig. 12, represents Messrs. J. and F. Howard's new plough. In a balance plough there is a tendency of the set out of work to lift the other set that is in the ground; and to neutralize a portion this (which is found disadvantageous in very difficult work), Messrs. Howard contrived an eccentric motion for the chains which held the weight of the two plough-frames, so that the set of ploughs in the air were much over-balanced by the set in the ground. In the present implement the balance principle is not followed, one set of ploughs rising or falling perfectly independently of the other. A main frame rides upon three wheels (B and C) by steerage-wheels running upon the unploughed land, and the third and larger wheel running along the furrow bottom. When travelling, or out of work, both sets of ploughs (A and D) are upheld in the air by chains and springs, coiled (like the main-spring of a watch) in small drum boxes on the main-frame. If one set of ploughs was taken off, the implement, over-balanced by the other set, would tumble over, just as a statue with outstretched arms might fall if one arm were cut off; but otherwise there is nothing of the balance or counterpoise principle in this new implement. It is not simply the supporting of the plough frames by springs that is peculiar. The position of the chain and the radial arm upon the axis carrying the spring is so contrived that when the plough beam-frame A B (fig. 13) is up, the radial arm is in position C, able to sustain almost any pull of the chain; but when the plough-frame is down at D B, the chain has pulled the arm into position E, where the chain being further away from the axis, has an advantage over the

spring, and only a small portion of the weight of the plough is thus sustained by it. Everyone who is familiar with the action of a printer's press will understand the great difference in leverage caused by the two positions of the chain and radial arm. Messrs. Howard

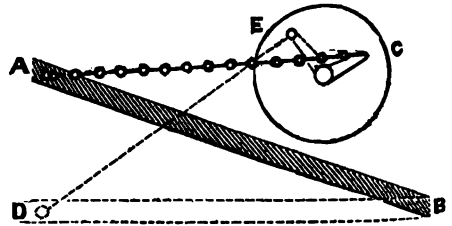


Fig. 13.

have not materially altered their cultivator with double-acting rocking tines and oscillating prongs. Their windlass consists, as before, of two winding-drums, upon eccentric axes, for raising them into and dropping them out of gear with the pinion shaft above; and this is connected with the engine crank-shaft by a spindle and universal joints. Their engine is a common portable, not self-propelling from field to field.

Messrs. Savory's system is that of two engines alternately hauling and paying-out a single length of rope, the implement traversing backward and forward without the intervention of any anchorage or snatch-block. The engine is of very singular construction. A cylindrical shell

drum, without any arms or spokes, surrounds the boiler, as in fig. 14; the steam cylinders placed transversely at C, over the steering wheel, drive the centre crank-shaft A B, which passes through the hollow drum, giving motion to it by pinions and internal teeth upon the drum. At B is a screw which drives the hind carriage-wheels of the engine, when travelling. A couple of rollers, traversing along a threaded shaft (D E) regulate the coiling of the rope upon the drum. The implement, hauled alternately between the engine at one

end of a field and another similar engine at the other end, is a Howard's cultivator or a Fowler's plough. What is required to improve this apparatus is a reduction of the speed by the introduction of a wheel and pinion upon another shaft, between the engine crankshaft and the drum, so that the implement may travel about 8 miles per hour instead of over 4 miles per hour; and it is not yet proved that a pressure of 100lbs. or more to the square inch is safe for a farmer's man to manage. The celerity with which two engines remove from

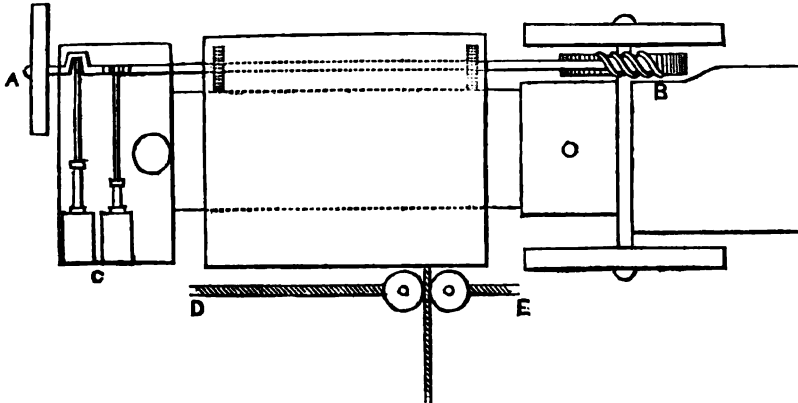


Fig. 14.

one field to another is surprising; there being no windlass and no anchorage to set down, and no rope to be laid out—one engine steams its way with implement and rope to one end of a field, the other engine takes up a position at the other end, and work begins directly. When the plot is finished, the engines move off at once, one with the water-cart, the other with the plough, not requiring even a single horse to assist them. This is clearly the system for individuals or companies who work by contract, and who can afford a little extra coal and water-carting, and the expense of two engine drivers, for the sake of expedition in work and in shifting. A small "donkey engine" feeds the boiler with water when the engine is not going.

Fig. 15 is a diagram of the cultivator of Mr. Williams, of Baydon. The tines are fixed to coulter levers which are hung to a coulter-bar, (A), and can thus accommodate themselves to any irregularity of surface. Mr. Williams

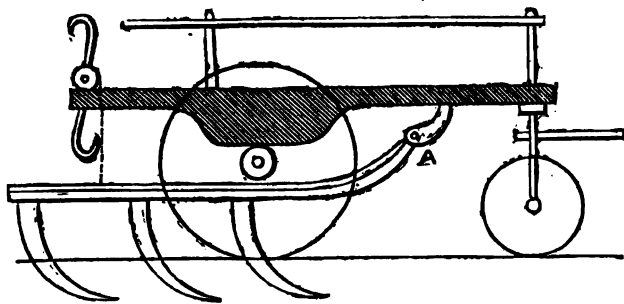


Fig. 15.

has also a set of drag-harrows, smaller-harrows, and roller united in one machine, with chain harrow following at the side, by which arrangement a very great deal of work is accomplished at a single stroke.

Our next figure (16) shows Mr. Collinson Hall's steel chain in plan C D and elevation A B. Rods of half-inch

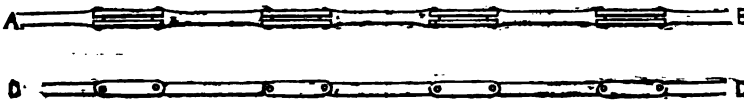


Fig. 16.

round steel, 18 inches in length, are united by rivets and plates of steel, four inches in length, forming a jointed chain. The weight is about one pound per lineal foot, and the price (which will be ultimately much lower) about £7 10s. per hundred yards. The inventor maintains that it is much more durable than wire rope, and that the repairs for broken rivets, etc., are very slight indeed. One dis-

advantage is that this chain does not work well over rope-ports, and hence considerable motive-power must be wasted in dragging it along the ground. And, as the rope will not coil well upon a barrel, much time is wasted in taking it apart into short lengths, and folding them for removal in a cart.

Messrs. Coleman's system is that of an engine and anchorage at opposite ends of the work; but two implements are employed, alternately hauled in work toward the engine, and then drawn empty toward the anchor for a fresh bout. Two drums on the side of the engine wind the two ropes, the coiling being regulated by the guide rollers A & A' (fig. 17). The rope passing round the anchor is very

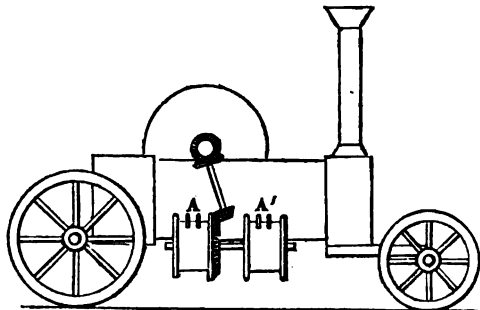


Fig. 17.

light, having only to haul the implements empty; and the anchor itself is also light, having little strain to withstand. The implements, of course, are the lightest possible, having no double set of ploughs or tines to carry.

Let us now take a stroll round the yard, noting the finest stands of machinery, and any novelties that may strike our attention. For the thick, heavy catalogue is a study for weeks after the show, with its more than fifty exhibitors of steam-engines, and more than forty exhibitors of thrashing-machines, almost every one of them showing several engines or machines; and no less than 5,839 articles, filling 231 stands or stalls.

MACHINERY IN MOTION.

A fine spacious area, surrounded by scores of black-chimined, coughing engines, that gave out a perpetual filmy cloud of white steam, and kept an immense succession of humming machines incessantly whirling and busy—an area traversed in all directions (within the limits of ring-fences, for the protection of the public), by traction-engines and their trains of vehicles, huge, yet guided with baby-like ease and facility, formed a spectacle most attractive to crowds of wondering sight-seers, as well as to investigating purchasers. A sight this not soon to be forgotten, forming, as it did, an exponent of the versatile adaptations and multiplied powers of mechanism for the help of the farmer.

In the shed of the trustees of William Crosskill we found massive bone-crushing machinery, with a reciprocating instead of a rotary cylinder screen for more perfectly separating the dust, and to guard against accidents by iron bars (or whatever else adulterating bone-men may put into old bones) getting between the serrated rollers; a break-ring or friction-clutch is provided, so that, in case of a block, the rollers can instantly stop while the driving-gear continues to revolve. In a large ring inclosure two of Messrs. Aveling and Porter's traction-engines, and another manufactured by Messrs. Garrett and Sons, displayed the power and value of the agricultural locomotive. The boilers we proved up to a pressure of 200 lbs. on the square inch, so that a nominally 10-horse engine will work up to 40-horse power with perfect safety. There are two "speeds"—for 2½ and 5 miles per hour. The engine will ascend an incline of 1 in 12 with a 20-ton load, and carries fuel and water sufficient for 6 to 10 miles. The steering is remarkably easy; the pitch-chain which drives the hind carriage wheel can be tightened up at pleasure, and the admission of steam to the cylinder is so arranged as to avoid "priming" when ascending steep inclines.

Norton's "V-pumps" exhibited by Messrs. George Warden and Co., attracted attention from the stream of water which they poured down a trough, causing a screw-bladed shaft to revolve. These pumps require no packing, and are not liable to derangement. Their peculiar mode of forming a vacuum can be understood only by a diagram. The "diaphragm pump" is a cheap and excellent contrivance, much upon the same principle as the American cow-milking machine. Messrs. Warner and Sons also kept up an endless cascade by means of a steam pump.

The portable sifting chaff-engine of R. MAYNARD is a very valuable adjunct to the thrashing-machine, as a day spent by the steam-engine in cutting and sifting, after a few ricks have been knocked out, enables a large quantity of good clean fresh straw chaff to be most cheaply prepared and stored for use.

P. and H. P. GIBBONS showed portable steam-engines, and their excellent combined thrashing-machine.

WILLIAMSON BROTHERS had a centrifugal pump with "whirlpool chamber," raising water, part of which was employed to set in motion a "vortex turbine"—a sort of centrifugal pump backwards—the descending water driving the wheel, instead of the wheel raising the water. This wheel of half-horse power, with a "head" or fall of water 8 feet high, drove a chaff-cutter.

ALLCHIN and SON'S 10-horse power traction-engine, careering in a ring, drives its carriage-wheels by means of spur-gear in place of a pitch-chain—a pitch-chain being used only for altering the position of the steering wheel. The weight is 8 tons.

The brick and drain-pipe machine of J. D. PINFOLD is of peculiar construction; a friction-wheel with straps is employed to prevent breakage, and a rotating frame of wires cuts off the continuous stream of moulded clay into separate bricks.

J. GILBERT'S portable engine is a curiosity, having an oscillating horizontal cylinder, working without any slide valves; the arrangement looks amazingly simple, and free from numerous working parts; but the objections to an oscillating cylinder are so great as strongly to counter-balance any advantage gained.

H. WRIGHT'S hay or straw stacking machine consists of an endless net distended upon chains. The range of height and distance is very great; but it is doubtful if a breeze would not carry away much of the stuff that should ride up; and the durability of the chain and net in constant motion remains to be established.

CLAYTON & SHUTTLEWORTH worked three of their celebrated portable steam-engines, and portable and fixed thrashing and finishing thrashing machines. The rotary elevator for the corn is a very effective apparatus, and the sample from the finishing machine perfectly dressed. The new drum-beater has serpentine ribs upon its surface, by which splitting and nibbling are avoided. Their straw carrier, instead of raking the straw up a spout or running it up on a net, takes up a bunch at a time, hung below an endless wire rope, an ingenious self-relieving hook letting the bunch drop when arrived at the pulley suspended upon a pole on the stack. Pulse or colder is carried up in a cloth. The distance and height are unlimited, which is a great advantage, and the price is much less than of any other straw elevator. Where the straw stack, however, can be placed near to the thrashing machine, other elevators dispense with the one man who is necessary to work this.

Messrs. HORNSBY & SONS' 12 and 8-horse steam engines were driving their portable combined and finishing thrashing machines. Their finishing machine has but three belts, and one belt is made to do duty as a corn elevator. The beaters are made double-acting, so that when one edge is worn, the other may be brought into use.

Messrs. BROWN & MAY, in addition to their portable

engines, showed a traction-engine of 8-horse power, mounted upon springs, and carrying the boiler in a side-framing, like that of a railway locomotive.

In Messrs. BARRETT & EXALL's shed were fixed barn-works, and portable combined thrashing machines, driven by their portable steam engines.

J. HAYWOOD, jun., showed his portable engines, having the cylinder vertical at the side of the boiler; and a horizontal cylinder engine, having a brass cover to protect the crosshead slides, and a rocking-ring governor (instead of the usual revolving balls), acting upon the expansion valve, and so regulating the admission of steam without any throttle valve.

A. B. CHILDS exhibited, among other "notions," the "nonpareil" chaff-cutting machine. The three straight knives are moveable upon the flywheel, their posture during revolution being regulated by a fixed eccentric cam in the centre; the arrangement giving a drawing-cut, similar to that of the old handknife. Redstone's American sawing machine, on this stand, is remarkable for its simple movement of a cross-slide, by which the great length of a crank and connecting-rod is avoided, and the straight reciprocating saw adjusts its own position to any vertical angle, while cutting through a log either lengthwise or across.

Messrs. E. B. and F. TURNER had a fine show of the roller mill, for which they are so noted; and their four-horse power portable engine drove a combined thrashing machine, which is capable of a very large performance per day, and turns out a first-rate sample, the dressing part being very perfect and efficient.

In the shed of PICKSLEY, SIMS, and Co. was a whole train of mills, bruisers, and a bone-mill, that grinds into dust instead of crushing the bones into lumps.

Mr. J. WHITEHEAD's big machinery, which has taken so many prizes, turns out two continuous streams of clay at once, cutting this into bricks, at the rate of 26,000 per day.

Close by, WARD and BUEMAN's smaller and very simply-constructed machines form the clay into "clots," one at a time, and then press each clot separately into the form of a well-shaped brick, at the rate of 8,000 or 9,000 per day.

Messrs. OLDHAM and BOOTH's massive bone machinery, and trains of farmstead machinery of Messrs. JOHNSON and WHITTAKER, and of MESSRS. BARROWS, excited considerable attention.

Messrs. TUXFORD and SONS' prize portable steam engines, some with horizontal cylinders, others with vertical cylinders, protected in an iron house, were driving their combined and finishing thrashing machines, which are much improved in the shakers and the riddles, dressing up also a first-rate sample. Their new straw elevator is a folding boat-like trough, up which the straw is conveyed by wooden forks or rakes, with upward pointing teeth, fixed upon a leather band traversing the bottom of the trough. The trough is raised or lowered by means of two double-acting wood screws, the range being 28 feet in height; and the straw is delivered from the shakers to the elevator by a self-feeding table—a flat table over which wood slots are swept by a couple of endless belts.

In Mr. BRUCKSHAW's thrashing machine we noticed a peculiar rocking motion, by which a shaft at the end of the machine alternately raises and drops the ends of the shaker-boxes, while at the same time giving the reciprocating movement to the shock-board.

Mr. F. W. ARBY & Co. had a stand of farmstead machinery, a mill, a thrashing machine, a chaff engine, &c., driven by two of their small and compensating portable engines.

Mr. S. CORBETT's root-pulper is a most efficient and valuable machine.

One shed, particularly thronged with spectators, was that where Messrs. POWIS, JAMES, & Co's "mechanical

wheelwright" was shaping four wheel-spokes at once by rapidly revolving cutters, flying the chips in all directions; and various boring, morticing, and tenoning was being conducted by steam power.

Messrs. RICHMOND & CHANDLER's chaffcutter, and other machines, of course formed a feature in this part of the Show.

Messrs. BURY & POLLARD had erected a six-sail wind-mill, self-regulating, so that springs upon the sails adjust their angle of position to the force of the breeze, while a furious gale will stop the rotation of the sails altogether. This machine is likely to be of much value, enabling farmers and others to make use of the cheapest of all motive power for operations where urgency of time is not a main consideration, and the work can wait till the wind begins to blow.

Close by we saw the Canadian clothes-drier, a sort of revolving frame of wooden arms and cords for hanging the clothes on, exhibited by Messrs. DRAY, TAYLOR, & Co.; but various forms of this new idea of an instantaneously raised and lowered clothes-line appeared on other stands throughout the Showyard.

Messrs. ROBEY & Co. exhibited a large and powerful traction engine.

Mr. J. GARDNER's chopping steam sausage machines drew many sight-seers; and hard by was Messrs. Merryweather and Son's light steam fire-engine, in which steam is got up to the working pressure in about eight minutes' time from lighting the fire, and 360 gallons of water per minute, it is alleged, can be discharged through the hose to a height of 160 feet.

Messrs. FARMER & BROUGHTON's brick-pressing machine is very ingenious—four moulds on a revolving circular table, receiving in turn the pressure of a die, which has a very singular motion. The machine is asserted to be capable of pressing or dressing 12,000 bricks per day.

Running round in a circular inclosure, Messrs. CLAYTON & SHUTTLEWORTH had a traction engine, dragging a strong and capacious waggon manufactured by Messrs. A. and E. CROSKILL. Messrs. Clayton and Shuttleworth also showed, in this part of the yard, a portable 5-horse engine combined with an Appold's centrifugal pump, placed in front of the smoke-box, adapted for drainage of low lands, or for irrigation. At a lift of 10 feet this machine will raise 900 gallons of water per minute.

THE IMPLEMENT STANDS.

Messrs. SAMUELSON and Co.'s self-raking reaper has been amended, the gear-work simplified, the frame-work lightened, and the whole remodelled.

On the stand of Mr. THOS. HUMPHRIES we found some improved cart-harness, constructed so as to give free ventilation to the horse's back, and prevent pinched or sore backs.

Mr. W. N. NICHOLSON had a fine stand, including corn-dressing machines, haymakers, horse rakes, &c.

Messrs. HILL and SMITH's stand comprised their usual large assortment of ironfencing, hurdles, gates, troughs, &c.

Messrs. WOOD and COCKSEGE had a large show of crushing-mills, weed-extirpators, &c.

Mr. HUMPHRIES showed his combined thrashing-machines and portable cider-presses.

On Mr. SANTON's stand, among many other articles scarcely agricultural, was an American rotary carpet-sweeper, quite an ingenuity in its way.

Messrs. WALLIS and HASLAM exhibited thrashing-machines, corn-dressing machines, corn-screens, spherical self-adjusting bearings for machinery, &c.

Mr. JAMES COULTAS showed his corn and seed drills, corn-dressing machines, horse-hoes, &c.

One of the finest stands of the show was that of Mr. E. H. BENTALL. Here we had the well-known broad-

sharer, subsoiler, and cultivator, in all its various forms, the famous root-pulper of this manufacturer, oilcake mills, oat and bean mills, chaff-cutters, a great variety of machines and field implements, all distinguished for their efficiency, durability, and cheapness.

Mr. CLAY showed his admirable cultivator and eradicator.

Messrs. A. and E. CROSSKILL have constructed the Victoria self-raking reaper in a very strong light form, free from chains, endless straps, and complicated gear-work. They showed also harvest and general purpose carts and waggons.

Messrs. FRANCIS PARKES and Co. had a stand of their first-class cast-steel draining tools, forks, spades, shovels, and other hand tools, which, small as they appear, tend in no slight degree to diminish the cost of labour upon a farm.

On Messrs. BURGESS & KEY's stand, of course, the chief objects of interests were the old roller-platform screw-delivery reaper, the combined mower and reaper, the grass mower, and the new reaper invented by McCormick, which rakes off the corn in sheaves, by an easy rotary motion. This machine is now being tried with the most satisfactory results.

Messrs. ARNOLD & SONS exhibited sets of veterinary instruments; among them was the curiosity of "an improved balling gun." You don't exactly fire the bolus down the horse's throat; but, with a sort of long pop-gun, you introduce the ball into the back part of the animal's mouth, and then eject it from the instrument by pressing down a piston.

Messrs. HENTON & SONS exhibited some new construction in harness: the saddle made with an elastic tree—made of leather and springs—causing it to fit better and more easily to the horse. This saddle, of course, is calculated to lighten the bodily labour of riding, and to be of especial value in the hunting field.

Mr. H. MACKINDER's potato separator is a decided novelty: a sort of rough Boby screen, made with wooden slats, reciprocating lengthwise over rollers, which sorts the tubers into three sizes, at the same time taking away

the dirt. It requires the means of adjusting to different sizes, and the edges of the slats might be less sharp with some advantage to the skin of the potatoes. But the notion is good, as the expense of riddling by manual labour is sometimes a heavy item. After all, potatoes must be hand-picked when at all sprouted.

Messrs. CUTBERT and Co.'s reaper for hand-delivery has been improved by the addition of a small carriage-wheel behind the shafts, which renders its working easier over deep furrows, and the main driving-wheel has a conical periphery, which, it is alleged, tends in a great degree to neutralize the side-draught of the machine.

On the stand of the North British Rubber Company we saw Mr. COLVIN's cow-milking machine, which has now received what it wanted at first, a change of the spring india-rubber cups to suit tests of different sizes.

Mr. GABRIEL LEWAL showed a heating and ventilating apparatus, a series of "prismatic tubes" to be placed at the back of the firegrate, by which a supply of warm air without smoke is secured for an over-head chamber or other apartment.

On Messrs. HORNSBY's large and fine stand, amid engines, thrashing and dressing machines, and ploughs, we observed their new turnip cutter. A disc is fitted with angular knives, which can be taken out singly or collectively for sharpening or replacing; and, owing to the shape of the flange around the disc, the last flat piece cannot escape until it is cut into narrow slices. The pulper is a disc fitted with sets of pointed cutters over as many holes, through which the strips of root pass; a reciprocating toothed slider, worked by an eccentric, clears the cutters, and ensures the pulping of the very last fragment. Messrs. Hornsby's new horse-hoe is an admirable implement, very light and easily steered, and the main axle is cranked, so that by a simple wheel and screw motion the hoes can be instantly dipped into harder ground without stopping for the purpose.

Mr. BEARDS has adopted a ploughing-frame in place of the single ploughs he worked by steam at Canterbury; the implement consists of a four-wheeled carriage, with two plough-bodies on a frame at each end, these being raised or lowered by chains and a barrel in the middle of the machine. The arrangement is very similar to that of the Messrs. Fiken.

[A number of other stands, and numerous articles, remain for notice in our next number.]

THE TRIALS OF THE STEAM ENGINES AT WORCESTER.

A TABLE OF TIME, POWER, CONSUMPTION, AND COST, AS PREPARED BY MR. AMOS, THE ENGINEER OF THE SOCIETY. PORTABLE STEAM ENGINES.

STEAM ENGINES.											
Name of Exhibitor.	No. of Stand.	No. of Article.	Horse-power of Engine.	Minutes taken in getting up Steam.	GETTING UP STEAM.		Coal burnt per hour in lbs.	Coal burnt per horse-power per hour	Price of Engine.	Remarks.	
					Fuel burnt in getting up Steam.						
					Coal. lbs.	Wood. lbs.					
TABLE I.	Hornsby and Sons ...	90	1946	12	48	62.0	12	45.5	3.79	325	Prize of £10.
	Clayton and Co. ...	11	142	12	99	47.0	12	46.3	3.86	343	" £7.
	Tuxford and Sons ...	214	5004	12	69	60.5	12	55.2	4.60	355	" £4.
	Barrett, Exall, and Co. ...	107	2539	12	123	67.0	12	55.8	4.65	310	" £3.
	Brown and May ...	288	5774	10	78	47.3	10	54.5	5.45	265	Commended.
TABLE II.	Tuxford and Sons ...	214	5003	8	81	32.5	8	28.7	3.59	250	Prize of £9.
	Barrett, Exall, and Co. ...	107	2538	8	99	50.2	8	30.3	3.79	230	" £8.
	Clayton and Co. ...	11	163	8	100	38.3	8	32.4	4.05	238	" £7.
	Holmes and Sons ...	86	1824	8	41	39.0	8	46.5	5.81	240	" £1.
	Haywood, Jun. ...	26	549	8	76	41.0	8	44.1	5.51	240	Commended.
TABLE III.	Ellis and Son ...	168	6053	7	76	40.5	7	57.5	8.21	220	Com'ded as good
	Parsons ...	226	5246	8	63	34.0	8	70.6	8.82	225	Ditto ditto
	Warren (Ruston & Co.) ...	147	3653	8	95	41.5	8	75.6	9.45	230	
	Gibbons ...	24	519	7	49	30.3	7	76.5	10.92	215	
	Robey and Co. ...	203	4827	8	47	39.5	8	95.7	11.96	230	
	Childs (Riches & Watts) ...	292	5779	8	69	44.0	8	96.0	12.00	200	
	Ashby and Co. ...	222	5176	4½	73	36.5	4½	57.0	12.66	138	
	Gilbert ...	69	1553	5	95	31.5	5	66.4	13.28	160	
	Brown and May ...	288	5775	8	55	34.0	8	51.2	6.40	220	Highly com'ded

FIXED STEAM ENGINES.

Name of Exhibitor.	No. of Stand.	No. of Article.	Horse-power of Engine.	Coal burnt per hour, in lbs.	Coal burnt per horse-power per hour, in lbs.	Price.	Remarks.
Barrett, Exall, and Co. ...	107	2537	10	48.8	4.88	£230	Prize of £15.
Clayton and Co. ...	11	141	10	50.4	5.04	240	„ £15.
Hornsby and Sons ...	90	1945	10	55.1	5.51	245	„ £10.
Ferrabee ...	135	3373	10	71.0	7.10	230	Commended as a plain screwable engine.
Tuxford and Sons ...	214	5014	8	56.5	7.06	200	
Haywood, Jun. ...	26	548	10	87.7	8.77	240	
Johnson and Whittaker ...	114	2867	4	61.3	15.32	85	

PORTABLE COMBINED FINISHING THRASHING MACHINES.

No. I. TABLE.

Name of Exhibitor.	No. of Stand.	No. in Catalogue.	No. of Sheaves of Wheat Thrashed.	Time occupied. Min. sec.	Gross horse-power used in doing the whole work.	Average horse-power taken.
Goucher ...	159	3982	100	6 55	61.95	10.11
Bruckshaw ...	314	5798	100	4 59	32.82	6.56
Burrow and Co. ...	67	1524	100	4 30	34.94	7.76
Barrett and Co. ...	107	2540	100	5 25	34.92	6.44
Tuxford and Sons ...	214	5016	100	3 55	34.68	8.85
Turner ...	208	1043	100	5 55	26.746	4.52
Clayton and Co. ...	11	153	100	5 25	37.623	6.94
Wallis and Co. ...	45	1071	100	3 50	32.651	8.52
Barrows and Co. ...	13	204	100	4 25	26.65	6.03
Hornsby ...	90	1956	100	4 25	30.38	6.88
Hornsby ...	90	—	100	4 0	30.95	7.73
Clayton and Co. ...	11	144	100	3 55	22.37	5.71
Clayton and Co. ...	11	—	100	4 10	25.02	6.0
Marshall ...	287	5765	100	3 10	31.	9.79
Nalder ...	25	540	100	4 0	27.83	6.95
Gilbert ...	69	1551	100	5 5	39.16	7.7
Gibbons ...	24	520	100	5 35	38.17	6.83
Underhill ...	218	5085	100	—	—	—
Underhill ...	218	5084	100	4 8	36.78	8.9
Parsons ...	226	5247	100	4 30	36.25	8.05
Tasker ...	122	3057	100	3 25	38.547	11.28
Humphries ...	42	1007	100	4 40	38.175	8.18
Robey ...	203	4826	100	5 55	52.488	8.87
Savory ...	56	1277	100	4 5	35.88	8.79
Holmes ...	86	1822	100	6 3	52.22	8.03

COMBINED STEAM THRASHING AND FINISHING MACHINES.

No. II. TABLE.

SELECTED AND FRICTIONAL TRIALS.

Prize.	Name of Exhibitor.	No. of Article in Catalogue.	No. of sheaves of wheat thrashed.	Time occupied in doing the work. Min. secs.	Gross horse-power used in doing the work.	Average horse-power to drive the Machine in work.	Average horse-power required to drive the Machine empty.
£10 Prize...	Tasker ...	3057	500	23 50	235.34	9.99	5.778
	Wallis and Co. ...	1071	500	15 50	152.96	9.6	5.535
	Holmes ...	1829	500	22 0	225.187	10.235	6.817
	Robey ...	4826	500	18 35	161.797	8.7	6.1542
£15 Prize...	Clayton and Co. ...	144	500	22 10	172.35	7.78	3.911
£25 Prize...	Hornsby ...	1955	500	17 36	170.05	9.66	4.8
	Barrett and Co. ...	2540	500	20 55	177.44	8.49	4.089

N.B.—Each Machine was run empty for Five Minutes, and the result recorded as per last column.

FIXED BARN WORKS.—No. III. TABLE.

Name of Exhibitor.	No. of Stand.	No. of Article in Catalogue.	No. of sheaves thrashed.	Time occupied. Min. secs.	Gross horse-power used in doing the whole work.	Actual horse-power consumed in driving Machine.	Actual horse-power required to drive Mach. empty.
Humphries ...	42	1008	250	16 40	93.29	5.59	
Clayton and Co. ...	11	145	250	12 55	75.89	5.83	
Hornsby ...	90	1958	250	9 30	79.26	8.34	£20 Prize
Barrett and Exall...	107	2541	250	10 35	90.3	8.53	
RENEWED TRIAL.							
Hornsby ...	90	1958	500	16 5	148.837	9.25	3.58
Clayton and Co. ...	107	2541	500	Strap came off, experiment discontinued.			3.98

N.B.—The Machines were run empty during a period of Five Minutes.

In this Table, One-horse power is taken as being equal to 33,000 lbs. lifted one foot high per minute; as also in the other Tables belonging to the class of Combined Finishing Thrashing Machines.

JAMES AMOS,

Show Yard of the Royal Agricultural Society of England, Worcester.

THE SHOW OF CATTLE, HORSES, SHEEP, AND PIGS.

There is an affectation with a certain class of critic to regard the great national agricultural gathering of the year as a mere mart or fair. People, as it is maintained, come in reality for the purpose of buying and selling, and if it were not for the buying and selling they would not come. Following for a moment the reasoning of such an hypothesis, then was the Worcester week more or less of a failure. The entries, to be sure, were very generally good, the awards were watched with still increasing interest, the arrangements were excellent, and the attendance was numerous. But "business" was unequivocally flat, and either amongst the stock or machinery we heard up to Thursday of little doing. Visitors, in fact, do *not* come specially for the purpose of buying, but rather to look on and learn, and then calmly digest the lesson they have learned. The public, in a word, continues to regard the Royal Agricultural Society as a national schoolmaster; and the world is as willing as ever to take its cue from the judges, whether these gentlemen be appraising a steam cultivator, a Southdown ram, or a Hereford bull. Does any one in his senses suppose that without such an incentive as this the show could yet rank as the great success it so unmistakably is? No doubt but that the direct effect of such an exhibition is the gradual extension of the best stock and machinery; but a man needs something more than the word of a breeder or a manufacturer to lead him out of the beaten path, and he finds this supplied him in the records of the Royal Society. The prize list is the accredited barometer of our rise or fall, telling us all plainly enough whether we are retrograding or advancing, and thus prompting the thousands and tens of thousands to study the state of the weather. If, as is so incessantly argued, the Meeting were but a mere fair, not ten in a thousand would visit it, nor one in ten of the exhibitors remain in the catalogue. But, fortunately, the occasion is still made something more than this; and, tested by its original aim, there have been few more useful, agreeable, or satisfactory shows of the Society than that just celebrated at Worcester.

The meeting opened well, as rarely have the preliminary proceedings commanded more attention; and this, too, in the face of an assertion that, whether the premiums for stock be persevered with or not, it was high time that such a system of rewards for implements were abandoned. Our special reports will tell how the trials of the steam cultivators were watched, and the performances of the steam-engines analyzed, not only by the judges, but the public. It is, indeed, doubtful which of the awards that we were enabled to give on Monday last would create the most sensation in the country. For our own part, we believe that the highest honours for steam-ploughing would be more talked over than the best shorthorn bull or the first thoroughbred horse; and a national congress of agriculturists, without any such wholesome stimulus to turn to in its programme, would have been but the awkward movement of a body with a limb lopped off. Not, however, that the taste for good beef and mutton is by any means dying out; and many a stranger, as he entered the wide and well-mapped show-ground, anxiously asked his way to "the beasts"; hurrying through, with just a passing glance, the handsome avenues of machinery, and curtly declining the many offers to take a list, or look at a plough, until he had satisfied himself as to who was first for Leicesters, or best man amongst the Cotswolds? And here, if we did allow of our friend picking the plums out of his pudding at once, we might send him amongst the sheep, the strong feature, taking all kinds and classes, of the whole Show. The foundation, moreover, was good, as seldom have the recognized breeds, either Leicester or Southdown, been better represented; while the Cotswolds made again a grand stand, and the Oxfordshire Downs proved yet more worthy to some rank of their own. Either for numbers, or individual illustrations of their order, we must repeat that the sheep classes were the best section of the Show; and such entries as Colonel Inge's pen of Leicester ewes, Lord Walsingham's Southdown shearling, and Mr. Robert Garne's Cotswold rams, may have been previously equalled, but they have

certainly never been surpassed as perfect specimens of their several sorts. In distinguishing these entries the judges by no means kept to any previous precedent, and it reads somewhat untoward, that in his last season, and just previous to his final sale, Mr. Sanday should have been so signally defeated as he was at Worcester. Still, it is consoling to feel that the Holme Pierrepont flock ranked only as second in one of the best general exhibitions of Leicesters ever got together; and that Mr. Sanday was but beaten with his own tools, as Colonel Inge has long continued to breed from these Nottinghamshire sheep, while his very shepherd comes from the same fold. Both the classes of rams were of a very high character, with very few indifferent entries amongst them, as the many commendations of our prize list will testify. The Thorpe Constantine shearing, of good size and admirable quality, is very perfect, and it would be difficult to pick a hole in him; while the five ewes from the same flock are the best pen of Leicesters ever seen together. Of remarkable uniformity, with sweet thorough-bred heads, great width, fine size, and a capital touch, they ran clean away from the rest of the class; as Mr. Sanday's seconds were not up to his usual standard, being only a middling lot, very delicate in appearance, and lacking something in size and growth. Mr. Borton, who has been in the habit of using rams from Sedmere and Holme Pierrepont, won everything with the old sheep; but his third prize ram was bred by Mr. Sanday, and is still further noticeable as the sheep over whose place at Battersea some rather angry discussion ensued, but where by the way he occupied amongst the shearlings precisely the same position he now claims amongst the all-aged rams. Mr. Borton only exhibited three in this class, and the first and second prize sheep were both bred at home. The best of the three, which was the first shearing at York last year, is a ram of great style, with good substance, active and cheerful in his character, and with a famous firm touch. The strength of the Leicesters may be in some degree estimated by the fact that so well known a breeder as Mr. George Turner sent several sheep, not one of which received any special notice from the judges.

Amongst the Southdowns there was some similar upsetting of great reputations. The Hove flock, for instance, was declared to have gone back, the rams having coarse heads and bad shoulders, with a certain delicacy about them that Downs are too apt to run into; so that, with the eight sheep shown, Mr. Rigden reached no higher than one commendation. If, however, one man had gone down, another had come on; and the extraordinary improvement in Lord Walsingham's flock was the sensation of the meeting. His lordship would appear to have at last brought the Southdown sheep to something like a standard of excellence, uniting style and quality with good size; and with, as the index to his advancement, his first prize very generally pronounced to be the best shearing of the breed ever exhibited. But this one was by no means suffered to stand alone, as the other half-dozen shearlings from Merton were almost equally commendable for the three great points of pedigree, mutton, and wool; on any of which considerations proportionate progress was observable, with five out of the seven individually complimented by the judges. Since the dispersion of the Babraham flock the late Mr. Webb's man has accepted service at Merton; and, as a consequence, the very common remark was that, "It's all the shepherd's doing." Fortunately for those who believe there is still some art and judgment necessary for breeding as well as for feeding or trimming, there was some other proof in the Worcester Show-yard that it was *not* quite all the shepherd. Thus, the first prize aged ram, now upwards of four years old, is the father of the first prize shearing, of the second prize two-year-old sheep, and of three of the ewes in the first prize pen. He is, again, the father of the Yarmouth and Ham-

burgh first prize sheep; and, above all, was bred by Lord Walsingham at Merton. Still, the career of this famous ram has been somewhat chequered: as a shearing he was first at the Norfolk show; and as a two-year first again at home, and third at the Royal meeting at Leeds. As a three-year-old he was only highly commended at Battersea; though at Dereham, a week or two afterwards, we thus wrote of him: "At Battersea in the old class the Merton rams were second, third, and commended to Mr. Rigden's sheep; whereas at Dereham the second and third were precisely in their former places, and the Royal commended sheep *first*!" Mr. Woods has all through maintained that this is the right reading of their several merits, and general opinion was again with him against another bench of Battersea martyrs." This was written a year since, but it is all equally applicable now that the father of the flock has further asserted his superiority, though he leaves them in his old age, having been sold previous to his Worcester triumph to go to Würtemberg. There was no cavil whatever as to the Norfolk Downs having it all their own way, and Mr. Rigden took his beating like a man; the only discussion whatever being over the third and fourth pens of ewes. Lord Walsingham's first were here again about the best out for many a day; capitally matched, with plenty of mutton of fine quality, and wool of undeniable texture; while the Messrs. Heasman's next best had beautiful heads and necks, with famous legs of mutton at the other end of them, their chief drawback being that they were rather over or badly trimmed. Three of Lord Radnor's five were really admirable ewes for almost any point, size, mutton, or wool; but a want of thorough uniformity in the whole pen stood in their way, and the third prize went to some rather small and delicate sheep of Mr. Farquharson's, but still far away the best that the old Dorsetshire Squire has ever yet set his seal to. The three classes of Southdowns, with such exhibitors as we have referred to, or that the commendations make special mention of, were altogether of a very high order of merit, though disfigured by the presence of a few sheep that had no pretensions to any place in a Royal show-yard.

Still, despite the stand they are still able to make, there is little question but that the old-established firms, like the Leicesters and Southdowns, are gradually losing some of their business, which is going over to such opposition houses as the Cotswolds, Oxfords, Lincolns, and Other Long-wools or Half-breds. Of these the Cotswolds and Oxford Downs supplied two wonderfully good lots of sheep, the former quite up to their previous repute, and the latter coming to the fore very fast. Never, in fact, was the grant of a class more fairly earned or better supported. The Oxfords, indeed, have a *deal* of good about them, either in the way of mutton or wool; and in the best flocks, moreover, there is an increasing uniformity of style that speaks to the care with which they are now cultivated. So far, in fact, as Worcester was concerned, the show of the sort was highly encouraging in every respect but one, and that was the shameful way in which many of the sheep were exhibited, the abuse being heightened by some of the worst cases winning the best prizes. It was good to see Mr. Bryan placed first with a fairly clipped clever shearing, though he was only a second at the recent Oxford Meeting; whereas Mr. Wallis's old rams looked as if they had not lost a lock of wool since the day they were lambed. The Duke of Marlborough's ewes, again, may be fine animals; but the judges must be wonderfully "up" in feeling for make and shape if they could exactly say what they were through the mass of wool in which they were smothered. Of course, conscientious men like Mr. Charles Howard and a few others have but little chance, while the Society permits of its representatives in the ring ending and abetting such monstrous evils as these—practices that tell alike against the conduct of the Meeting and the character of the sheep. Breeders of other varieties turn away with a smile of contempt from these

hapless Oxfordshire Downs, sweltering in a July sun under a two or three years' fleece. They must be bad-framed animals, indeed, when their best points require such elaborate concealment; or, at least, that is the palpable argument which the world will draw from the heavy overcoats so much in fashion with too many of these Oxford mixtures. There were upwards of fifty shearing Cotswold rams entered, and mostly of that grand imposing appearance, for which of late years they have been so celebrated on the show ground. There are, certainly, few sheep that tell more when put upon parade, the besetting sin here being still to overmark many of them in the way of condition, or otherwise the Worcester sample was very commendable for general excellence, there being perhaps no other so even a lot in the whole catalogue. Still, Mr. Robert Garne had the cream of it, taking all the premiums in the large class of shearlings, and finished first also in the more select company of aged rams, all of which were commended, and amongst them the brother, Mr. William Garne's first shearing at Battersea. The Aldsworth best old sheep, now in his fourth year, has worn well, and still retains as a great point in his favour a fine firm touch, not too often a characteristic of the kind. Noticeably enough, Mr. Fletcher, the winner of the first prize for ewes, was not satisfied with the award! considering that he should have won with his other pen. The Lincolns had the worst of it, as opposed in the open class to the other long-wools, Mr. Lynn ranking first and first in the only two classes he entered for, with his now well-known cross of the Leicester and Lincoln; his old sheep called "Battersea Royal" having been the best shearing in London last season. From some cause or other the Lincolns make no great impression on the show-ground as compared with their accredited worth in the market, and there were no classes at Worcester that attracted less interest than this mixed company of Other Long-wools. Three very good classes of Hampshires and other short-wools owed much of their excellence to the presence of a new exhibitor at the Society's meetings—Mr. Rawlence, who opposed even Mr. Humphrey with quite his share of success. In fact, the three pens of ewes from Balbridge were the finest lot of West Country Downs ever brought out, and the first five very admirable for nice style, coupled with good useful qualities. Mr. Rawlence is clearly an accession here, and Messrs. Humfrey, King, Canning, and Shittler will have to look to their laurels.

Firm as has been our faith in the Shropshires, they have not made that general advance of late which we had expected, and there is not much progress to report at Worcester. Either there is no reliable type, or the judges go by very different roads to get at it. Here they went all for magpie faces and speckled legs, and more for mere size than symmetry. Mr. Stubbs' first prize shearing, although with some good blood in his veins, is a very uneven sheep, standing badly before, and nothing extraordinary from behind. He began public life early, however, and was a prize-trimmed lamb at the Staffordshire Meeting of last year. He will now, probably, go on hire to Lord Shrewsbury, while one of Mrs. Baker's very sorry lot crosses the Channel for Ireland. It must have been his size chiefly that carried Mr. Bowen's old ram through, as there were far truer sheep in the class, and he was nowhere at Battersea; whereas the exhibitors of the ewes took here precisely the same rank as in London, with the Messrs. Crane first and second, and Mr. Matthews third. These pens of ewes were, moreover, the flowers of the flocks, and the Shrawardine second prize lot considered to be the best that these famous breeders had ever exhibited. One of Mr. Foster's ewes had been injured, but nevertheless the pen was highly commended, and of twelve entries the judges specially noticed seven. The aged rams only ran up to one more nomination, being an unusually short class, and with a deal of difference over the awards, Mr. Coxon's third prize sheep, and a very handsome one, being in the opinion of many, as good as anything. The judges, indeed, were picked to pieces in many more "cases," and amongst others Mr. Orme Foster's merely commended shearing, with his fine countenance, true frame, and grand character, was continually cited in judgment against them. It was further deduced that not one proud Salopian had been invited to take office over the native sheep of his own county, and that, whether the breed has improved or not, the Worcester Meeting hardly got at the best of them. A few good useful Ryelands were sent out of Herefordshire to carry off the local premiums, Mr. Downing, as at Hereford,

having it pretty well to himself; while Mr. Peel's Lucks met with as little opposition amongst the Mountain breeds. Regarded from the map, Worcester itself would not promise anything very remarkable in the way of mutton or wool, but a variety of circumstances, influenced mainly, no doubt, by the tendency of the times, will give the Worcester sheep show a very prominent place in the week's history.

There was, of course, more direct argument for the strong show of Hereford cattle, indisputably the most evenly excellent entry of any breed on the ground; although in mere numbers these did not exceed the Battersea complement of something under a hundred in all. True in their frames, wealthy to handle, and handsome in appearance, the first class of old bulls at once betrayed the "weakness" of the white faces: from sires to sons, or cows to calves, there were but too many over-fed; and one or two, as we hear and hope, really set aside as too fat for any becoming example of what a breeding animal should be. Both the first and second prize old bulls were alike equal to this objection; but Plato carried his beef more equally distributed, and had altogether a more active, lively look than Sir Oliver, very palpably over-marked, and as short of hair as if he had been singed. He has, otherwise, many of the points of a grand bull; but, for a combination of quality, symmetry, and usefulness, we are still of opinion that the first and second should have been the other way; and the judges themselves were quite open to discussing the question. Lord Bateman's bull is short and thick, but with something very attractive about him, and Raglan was worthy of more notice than he received. The next division was a class of as good animals as are often seen together, with Mr. Taylor's Tambarine quite the best bull in the Hereford classes, combining those great requisites of the day, size, quality, and substance. Moderator, the second best, has good length, but somehow with hardly enough of grandeur about him for a prize bull; and more attention ought to be paid to style than to a mere lump of flesh. The third prize went to Mr. W. R. Evans, jun., for Rodney, a very nice animal, with not quite the right sort of hair upon him, but plenty of it. He was first at Hereford last autumn, when we gave him a character; and he now pleased us as much as many we saw in the class, while a question was raised by some as to his not being placed higher. Chieftain the 2nd had a great deal of good about him; and the unnoticed Victory, with his magnificent hind quarters, has such length as is not often seen. Amongst younger bulls was the renowned Battersea, bred by Mr. Vevers, and exhibited by Mr. Baldwin, of Luddington; beaten, or, as many said, "placed" second to Adforton, one of Tudge's breeding, and, like all his sort, a thick one, but hardly so long and level as he should be. Battersea, as we reported of him at Exeter, has trained off, or rather not being in Mr. Vevers' hands, was not shown in last year's form. The third prize of Mr. E. Tanner was an animal with very plain heavy shoulders, that told against his nice rumps and thighs; while Mr. Pitt's San Jacinto had a deal of good about him; and, upon the whole, this, with one exception or so, was a very capital class. The bull calves were good, and eighteen in all, with not a bad one among them, speaks well for the breeders. The first prize of Mr. Roberts, of Ivington Bury, Leominster, is a nice calf, with an awkward dip or weak place in his back; but he showed much better out in the ring than in his place in the line. He had rare thighs for so young an animal, and plenty of hair, of which Mr. Capper's second prize, Worcester, was rather deficient; in fact, with his famous fine handling back, the judges were inclined to go for him, had it not been for his want of hair—a sad failing in a Hereford calf. The third prize, and a high commendation for two calves

of the same herd must have caused some trouble to separate, as both were very creditable to the owner. There were such a lot of famous cows, that for size and quality have rarely been matched; indeed the first prize one of Mr. William Perry, of Cholstrey, with a calf a few days old by her side, was just what one would like to see more of; and the second also a very good one; while Mr. Duckham's eight-year-old cow would do credit to any herd, as it is rarely we see a Hereford attain that age without getting very patchy. Perhaps, with the years upon her, this was almost the best cow in the class, and she might have been placed higher in the list. A commended cow of Mr. Turner's did not appear to have done much towards increasing her owner's stock of cattle, but nearly all the cows shown were as a class good, and must be considered a credit to the breed. The in-calf heifers are usually the best class of the sort, but here they were not so well up to the mark. Mr. William Tudge's nice thick heifer has a rare lot of hair, but is not a very good one to meet, nor are her head and horn quite right. The second is not of a good colour, being lighter than is now quite the fashion; and Major-General Hood's highly-commended heifer, with rare thighs, back, and rump, was still not fine enough forward; while two heifers shown in this class by Mr. Thomas and Mr. Williams were thoroughly spoiled from over-feeding. The yearling heifers were a better lot; with the veteran Mr. Monkhouse, of Stow, receiving first prize for one of rare size and quality, but with a little tendency to patchiness about the quarter. The second of Mr. Roberts was perhaps the most perfect in form of any of the females, and, as many considered, should have been placed at the head of her class. Mr. Perry's heifer's only fault was her diminutive size, but with good hair, she is one of the neatest out, while another great good one of the same herd was worthy of a place in almost any company. She was certainly not out of place here, with the whole class commended, and a lot as good if not better than any hitherto ever brought together. The calf class was headed by Mr. Roberts with one of rare substance, but hardly quite right about the shoulders; though still, for her age, worthy of her place; and Mr. Knight's, of Downton Castle, "grey" calf, is one of a famous sort in days gone by, and with a touch that would bear comparison with anything of any breed. The local prizes brought out but a short lot, chiefly noticeable for a pair of rare massive heifers shown by the executors of the late Mr. Rea, of Monnaughty, whose stock come to the hammer during the autumn; but the bull, cow, and calf, or "happy family" entry would bear no comparison with what we have seen in this way in the capital of their country. Sir Thomas, however, like the other two prize bulls, Sir Oliver and Plato, traces back to the Westonbury herd, and the Tribe of Benjamin was in high favour at Worcester; as indeed, were the white faces pretty generally.

With nearly double the number of entries, as compared with the Herefords, and reaching in all to somewhere about a hundred and eighty head of cattle, the Shorthorns were by no means so even a sample of their sort. On the contrary, they were a very ragged lot, with a number of drafts in almost every class, and scarcely one really grand animal amongst them. It was not, in fact, until we had travelled on to Mr. Eastwood's white yearling bull, The Hero, and had coupled him with our own old acquaintance of many a meeting, Lady Pigot's Pride of Southwicke, that we came to anything like really "Royal Firsts." Still the best old bull, Mr. Wilson's Duke of Tyne, is a well-known winner in the north—at Hartlepool as a calf, at the Durham County, and at Belford; while he is by Richard Cœur de Lion, a bull that Colonel Towneley sent up for the use of his north-country tenantry. Then, Mr. Wilson himself was not only one of the Judges of steam-ploughing at Worcester, but the acting Secretary to the

local committee that a month or two back secured a second visit from the Society for Newcastle-upon-Tyne; so that even beyond his personal appearance the prize bull has many contingencies in his history. There is no question, either, despite one of the judges declaring against him, that he was the best of his class on Monday; and when seen out is a very telling animal. With great size, a deal of character, and of good quality, he is wonderfully fine forward, and would be a very imposing animal to meet, but for his long plain effeminate head, which must always be a strong point against him. General Murat was also second at the York show last year, where we spoke of him as showing more use than style, a point in which he is still terribly deficient. In fact, instead of preferring him to Duke of Tyne, the general opinion was that Mr. Brawn's lengthy and handsome Young Radford should have had second place. Amongst the commended Mr. Clayden received no notice for his elder Marquis of Cornwallis, while Lord Feversham's blood-looking bull showed a deal of his sire's high quality and temper. If this all-aged class did not evince any extraordinary form, the younger bulls were yet more moderate; and the winner, Hemlock, plain and narrow, with a coarse coat, and bad either to meet or to follow, was continually objected to; Mr. Peel fairly beating him for symmetry, style, and promise. The third prize introduced us to another of the Butterflies, but one with just the family character—light, airy, and all breed and fashion. In the next division we pause before the shorthorn bull of the show, a yearling with hardly anything but his colour (white) to be offered against him; level and long, with capital hind-quarters, good ribs, and a famous touch, The Hero should go on, for he is by no means over-marked as yet; and his place thoroughly due to a happy combination of such essentials as symmetry, growth, and quality. He is as yet a very young one as compared to many others in the class, and at all points but sheer forcing a very superior animal to the gold medal white of Battersea-fields. Still, another Butterfly, light, leggy, and stylish, was declared to be a very close second; while a more clumsy one, of something the same kith and kin, with the dreadfully clumsy title of "French Butterfly's Cœur-de-Lion," was an indifferent third. What a name for a herdsman to handle, or even an editor to book! In the large class of Calves Sir Anthony de Rothschild tasted first blood with a very clever one—fine in his coat, famous in his quarters, good in his bosom, and remarkable for his quality; but Mr. Garne's second, light, narrow, and common, was less liked; and Pretor, with plenty of Bates' character, showed the family failing of forward shoulders. The judges appended some commendations to their award, but it is a serious question whether a few of the best were not kept out of it? There was no doubt as to Captain Cherry's claim, but it was anything but so clear as to the actual merits of the second, or even the third, of the selected. Only five cows were entered, and we thus wrote of the first and second on meeting them at Exeter a month or so since: "The Pride of Southwicke, who never looked better, promises well for Worcester, where she may even improve on her previous place at the Royal; but the Maid of Athens has got a little gaudy behind—always her worst point, and we do not expect to see her again with anything like her pre-eminence at Wells and Battersea." It was in truth only the weakness of the class that let Mr. Lane's cow in for second at Worcester; Lord Spencer's, with some fine points about her, having gone all to pieces, and being no longer fit for "the flags." Both the prize heifers, also, the deep, sweet-headed Rosedale, and the neat well-finished Queen of the May, look more like qualifying for Islington than breeding-purposes; while Col. Towneley's couple of beautiful Butterflies would promise to be of more

service in the herd, and hence, may be, their secondary honours in public. The Duke of Montrose's yearling, or just upon two-year-old heifer, is again all forcemeat, and certainly an extraordinary example of what may be done in the way of high-feeding; though encased as she is in fat, still said to be seven months gone in calf. Frederick's Farewell is of a different order of merit, but still a very nice one; but many of the other clever calves of last year had not trained on; while we heralded the approach of Lady Oxford 5th, the best heifer calf of this year, when we saw her at Witham, "full of symmetry, style, and quality, and likely to hold her own on any ground." Mr. Oliver's second is small and neat, but yet with the promise of going on, and another Butterfly finished in their customary place at Worcester—second or third as often as they pleased, but never quite first. As with the Herefords, the extra premiums for pairs and family parties were not successful, and the Queen of the Ocean and Soldier's Bride, as full of good fat beef as a butcher's shop in Christmas week, furnished something very like a burlesque on what the Society does in the way of milking cows. These were pushed off into the Other Breeds, where Mr. Bloxside with a hand and heart for the good firm flesh of a Hereford, would look at nothing beyond a Longhorn, a Runt, or the Norfolk and Suffolk polled—the latter in some force—and on the strength of being good milkers carrying all before them. The exhibitors, however, of the Channel Island Cattle are anything but satisfied, maintaining that they have purity of breed to begin with, and that butter and milk-producing animals are entitled to some distinct recognition from the Society. They say, further, that it is mere folly to show a milking cow against a fattening beast, especially with judges who know of, or prize nothing but beef. On these grounds a deputation had an interview during the week with Mr. Hall Dare, when they suggested, or, rather, directly solicited, for separate classes for the Alderneys and Jerseys, backing their prayer with the fact that more of these cattle, even under present disadvantages, were sent than of the Sussex beasts, where, in a special class, twelve premiums were handsomely offered for just about as many entries. The general show of the Islanders, however, was not so strong as at Battersea, and the Guernseys were altogether indifferent; but Mr. Gallais' Jerseys were far better, and his third-prize heifer a very pretty specimen of her breed; while Mr. Dumbrell's prize bull, another good one, found a purchaser early in the week in Lord Binning. The weak place in the Prize List is no question this lack of any encouragement for the *best* milk and butter; and though the Society does travel north next year, we trust that the prayer of the petitioners will be entertained, and a Channel Island class established. It would be sure to be popular especially with the general run of visitors.

The show of Devons was to a great extent but an echo of that at Exeter, so that it would seem such leading men as the Davys, the Quartleys, and Halses have this year really nothing to send. Mr. Newberry's Prince Jerome, as we wrote of him at first sight, is "a deep square blood-like animal with fine flesh and a beautiful bull's head and bright eye"; and the famous Viscount "in better form than at Wells, has still never thoroughly recovered from his early forcing; and though a great wide bull, has grown out of shape, with a loose, bad quality when you get your hand upon him." These two come into direct competition at Worcester, with Prince Jerome still first, and Viscount second. There were only four bulls in this class, and only two in the next, where Mr. Surman was first, with a lengthy, true-made animal of high character, from the herd of Mr. George Turner, who was himself a winner with the thoroughbred Drone (though his commended Trumpeter was of better quality) as well with the

pretty little Devoniensis, and a heifer calf. The Royal herd, however, was very strong amongst the younger stock, and Prince Alfred and the Rose of Denmark proved worthy of their titles. The former is a very promising, straight, lengthy bull, and the heifer very blood-like in her appearance. The old cows, a generally commended class, as it also was at Exeter, included many of the same animals: Young Hebe first in the West, and Golden Drop—two cows which, with the winner Rachel, were got out of so prematurely by Lord Portman; while old Cheerful, "a grand cow still," has been second at both these leading meetings of the year. From amongst the heifers, Mr. Hambro's Lina, "very handsome and useful," was still first and first, with Mr. Perkins' Alice third and third, but Mayflower now put aside for Mr. Farthing's Jenny. Of the younger things, Mr. Buller's, the best female at Exeter, was, of course, still the best at Worcester; and, in fact, as we have said already, the one show is far too close a reflex of the other. Nothing but General Hood's nominations gave the visitor who had seen the one any inducement to follow out the other: and if we were not quite satisfied with the stand the Devons made in the West, we were the more disappointed with all they could achieve at the great national gathering of the year, and that not so very far from home either. Fifty entries in all, for one of the three established breeds, does not compare well with a hundred Herefords or nearly two hundred Shorthorns. The editor of the Devon Herd Book must look up his champions.

The horse ring at Worcester was decidedly the centre of attraction, in spite of the straightest backed bulls, clothed cows, improved pigs, or sheep with the whitest of wool, clipped in the "last new style" by the most fashionable and scientific of shearers; of steam ploughs, traction engines, thrashing or washing machines, and the most complicated of rat traps. After all that has been said and sung about the deterioration of the breed of horses, one thing at least was very apparent from the expressions that continually broke forth from not only the men, but the lasses in the crowd after crowd that encircled the ring, viz.—that, if the horse be deteriorated in breed, the Englishman's love for him is in no way diminished, and that we are as proud of him as ever. The roped ring and comfortable boxes, although on a smaller scale, continually reminded one of Battersea, Mr. Tom Pain still being "The Genius," and keeping admirable order in the quietest and pleasantest manner. For the Royal hundred a dozen stud horses entered the arena, all considered by their owners as best calculated to improve and perpetuate the sound and the stout thorough-bred, and which was duly confirmed by the judges highly commending the lot:—Rouble, by Cosack, a neat level, hunting-looking bay, with smallish thighs and hocks; Ancient Briton, a chestnut, very wiry, muscular and lengthy, with shoulder well laid back, rare quarters, short back, long thighs, and hocks near the ground; still, he was rather leggy and had not the most agreeable countenance, but is nevertheless a very useful horse; Plum Pudding, a dappled bay, well christened, being a heap of flesh and as round as a dumpling; Malek, a weak-necked, stilty, and flat-sided animal; Cavendish, a rich dark brown, with fine frame, and very muscular—short legged, and all over a really stout, hardy-looking animal, with fair action, if perhaps a little short in the thighs; Neville, a vulgar-looking horse, with a coarse heavy neck, and low harness withers, bad forelegs, weak arms, elbows in, and pasterns that all but let the fetlock joints on the ground as he threw his legs about; as if he wished to get rid of them—a style of going that ought to have shafted him long ere this into some Lord Tom Noddy's cabriolet. There is nothing like good action; but we do not think that false, flashing, flourishing action ought to be encouraged in the show-yard, because

through some ever-varying whim of fashion it now happens to command a price. And we would seriously remind our judges that there are far more graver things to be thought of than the mere capricious tastes of Piccadilly dandies, when awarding a prize to a thoroughbred horse for general stud purposes. Let our authorities endeavour to set the fashion, not to follow, by going in for the useful as well as ornamental—for a horse that bends the knee, strikes out from the shoulder, with elbow free, setting his foot down firm, and at the same time getting over the ground; and not by upholding your flashy Nevilles, throwing their legs about like ballet-dancers, or the pony Tom Sayers, hammering away in the same place like a blacksmith at an anvil. Conscrip was common, light, and sickle-hocked. Cambondo, the lady-killer, never looked better, being made up to a nicety; but nothing can hide his deficiency in the back ribs. He is short and leggy, but good-limbed. Lord Albemarle, a switch-tailed bay, and Cawood, a dark brown, were not the sort of horses required; nor was Stampede, though low, laggy, and powerful, as his hocks ought for ever to disqualify him for such a prize; while the last, Merryman, was a short cobby horse, with a badly set on neck, and a head somewhat resembling Mango's, the sire of his dam. However, Neville took the first prize, Cavendish the second, Cambondo the silver medal, and Rouble had the honour of being kept in the ring longer than any of the others. The next class, worded as "Stallions suitable for getting Hunters," made any thoughtful man immediately inquire what ever the previous class was intended for? and we are very glad to hear that the judges have recommended the abolition of the other henceforth, as we recommended that it should have been long since. A greater medley never appeared in a ring, consisting of gig-horses, carriage-horses, trotting cobs, cloathes-horses, if we may judge them by their wooden looks, and one great lumbering brown, suitable for a carrier's cart. Amongst the better was Sir Peter Laurie, just nineteen years old, and just the very sort of horse we want to get rid of—the modern steple chaser, a nag with a neck like a giraffe, as leggy as a foal fresh dropped, with a very light middle-piece, and that gone in the back; yet this was the horse that took the first prize, and that thousands were to carry away in their mind's eye as a model to get hunters! Whitmore, a chesnut four-year-old, with a little more bone would have been the sort of horse, though only fifteen-two or three; but two years may yet do something for him. Ellicott, a short-legged horse, with a stain in his pedigree, of a strong frame, and showing a deal of character, but short in the quarter, and a gingery mover, with a large-capped hock, took the second honours; and Safeguard, a twelve-year-old chesnut, up to as many stone, with the true hunter stamp, but lacking the blood of Whitmore, was the third. The Prince of Wales was lengthy and light; and Solferino long, low, and deep-ribbed, and a good marcher was, barring a heavy neck, not an unlikely horse. Solferino, Whitmore, and the Prince of Wales were ordered out of the ring almost before they had completed the circle; whilst Bromley, who had a damaged leg, through getting across an awkwardly-placed bar in his box, had the honour of being kept in to the last, making his owner fancy, for a time, the prize was actually going into the land of Bucks! The premium for brood mares for breeding hunters was awarded to Lalarge, a thorough-bred one, with a capital shoulder—a great point in any riding-horse, especially a hunter, but a recommendation which, in this class and the others, was rather scarce. The second prize went to Whisky, a long wiry-looking brown; the third to Salt Fish, a good stamp, and roomy. The hackney brood mares were not well represented, the first prize going to Crafty, a stout, common little mare, of about

fifteen hands; and the second to Polly, who was too much of a pony, though Cygnet was clever-looking. The prize for stallion ponies was won by Tom Sayers—a heavy necked cobby animal, with hammering action, which his groom could afford to imitate, bringing his knees nearly up to his ribs, and causing great merriment to the bystanders, but at the same time showing that Tom was not getting over much ground. Dick, a brown, a hand higher, and a long stylish animal, with great liberty of action, had far more appearance. Pretty Lass, the prize pony, a thick mare, has, as we reported at Ipswich, no action to back her looks; and Enid, from Norfolk, is one of a match pair. Then came the "mares or geldings exceeding four years old, equal to fifteen stone with hounds," which was decidedly the best represented class of the meeting by a very long way, and containing many really fine framed horses. There were in all six-and-twenty, and, as they came one after the other into the ring, Worcestershire gave vent to a prolonged note of admiration, "What a fine lot of horses!" But fifteen stone with hounds is a great weight; two stone less would have been more agreeable to many of them. The first prize horse, Mr. Booth's "Beechwood" is up to the weight, with a good shoulder, but greatly disfigured by being fed like a bullock, and having rubbed the hair from his dock. The second best was a nice-looking bay mare, Elastic, with not the best of shoulders nor the shortest of cannon bones. Endurance, one of the specially commended, was of a rare stamp, barring a loaded shoulder; Brilliant, a good goer, but light in bone; Blitterlee, a thick little bay; The Confederate, a nice horse but small; Mr. Wheeler's a good sort, and Middleton a short useful horse, for the country. Merlin was not amiss, and Bessie Swinton showed some blood, whilst Perfection in form was perfect as a hunter, but of a smaller stamp than Beechwood; Topay, a stout hardy-looking mare wanting a dash of blood, and The Pelican looking more like wianing a hurdle race in the wilderness. Steam Plough, an extraordinary animal for power and action, well up to twenty stone in a confined country, brought forth further exclamations of "Look there! what a horse!" and the only fault we had to find with him was that he reminded one a little too much of the plough. Mr. Gilford's bay at once put you in mind of the country from whence he came—Leicestershire; Little Bobby is a neat thick little nag, while Mr. Philip Smith showed a very nice chesnut mare, and Mr. John Watson an old-fashioned one; both up to weight, and both out of Worcestershire. The next class offered prizes "for three-year-olds likely to make a hunter or carriage-horse;" but probably the gentlemen who drew up this heading meant a hunter and a carriage-horse—with, in fact, an eye for something quiet to ride and drive. Harold, from Shipeton-on-Stour, is a horse with not the best of heads, but in every other respect likely to grow into a first-rate hunter; and Brunette, a mare of good form, strong limbs, and showing some blood. Of the others, Mr. Morris' The Premier, two of Mr. John Philip Smith's, and one of Mr. Henry Lakin's, were the only other entries promising to make hunters. Of the two-year-olds "likely to make a hunter or carriage-horse," Grafton is a nice-shaped game-looking animal of a bad colour—a dirty spotted dandy grey russet; while Parvenue, his second, is another likely-looking one. The choice of the others were Event and Rowley. Of Mr. Branwhite's two cobs under fifteen hands, the chesnut is a very nice nag, and with the right sort of action, but the other is too common and carty in his appearance, and short in his going. Fairy Queen was a nice light hack, with a capital shoulder, but doubtful hocks, very neatly fired; and Mr. Moffat's four-year-old looked like growing into something sweet, as did Mr. Haskney's Peter Simple. So far the show of horses was encouraging, and in some classes, such as the weight-carrying hunters, remarkably good. With, again, Cavendish first, and Neville anywhere else they chose to put him, the third offer of the thoroughbred hundred would have quite reached its aim; and many of the young riding-horses were commendable. In fact, this section of the show is manifestly improving; whereas, if we are to take Worcester as the test, the agricultural horses are as palpably retrograding, for it is many years since so small or so poor a lot of draught-horses have been brought together under

the auspices of the Royal Society. Try them by almost any class or breed you would, and they were alike wanting in numbers and merit. Possibly the Hamburg Meeting operated in some degree against the success of the Worcester, and travellers do assure us that The Brewer and the Clyde horses exhibited on the continent would have been a decided acquisition to our own show of last week. The best of the open class, Black Prince, is a heavy, useful animal, of great power, and active for his size, but still with no extraordinary merit about him; while the Clydesdale, placed second, is a far truer-made horse, and deservedly in general favour with the public; so much so that the judges must surely have had some peculiar reasons of their own for not ranking him higher. The next best is very like his sire, Glengarry, but with his fore legs too small for his big top, and no action to recommend him. Of the two-year-olds Mr. Coney's couple of useful cheanots are rather light in the girth, and Mr. Holland's third a great, growing colt that promises to go on; but the Royal Windsor pair are both backward, and do not threaten to ever take any equal place with their sire, the Chelmsford Britain. Mrs. Bull's old grey is a very good sort of mare, that we noticed at Hereford in the autumn, and the roan second still better, but for a want of power just above her hocks, the best two-year-old filly, a very clever, promising one, and Colonel Pennant's showy enough, but with more style than with or weight. The choice of all the draught horses, however, was Young John Bull, the dray-horse, and a very fine illustration of the sort required; of good size, great power, active and handsome, and a long way before the others of his class in all the essential points of appearance and character; although, perhaps, it was hardly fair to try Mr. Neale's smartish three-year-old by the side of an aged and thoroughly-furnished animal. The selected brace of two-year-old dray-horses won against little competition; the other class of two-year-old fillies resulting in no entry, and the mares and foals in but a single nomination, of no apparent merit in either mother or child, and scarcely worthy on any consideration of a Royal first. But it was in the special class of the Suffolks that the falling-off in the cart-horse classes was more particularly observable, only one aged stallion being sent to compete for two premiums, and one mare and foal to keep him in countenance in the companion class. Of these Duke could never have the ghost of a chance at one of his own native shows; but Sir Edward Kerrison's Bragg is of a far higher stamp, being a grand mare all over; a royal winner before now, and the second of her class at the Ipswich meeting a few weeks since. Mr. Ward's fine filly was again first, and May-bird had also a place at home, as well as here, though at best but a light one to look on. Over the two-year-old colts Mr. Barthropp must have been clearly out-voted, as handsome Young Emperor has now to give way to Mr. Mumford's more useful colt, the award the other day showing a preference for fashion—a point in which Young Duke is singularly deficient. A variety of reasons were offered for the short show of cheanots, in such woful comparison with the imposing entry of last year at Battersea, prominent amongst which was the want of railway accommodation; the authorities only agreeing to take stock free one way, on the homeward journey, and even then the horses would have to travel in cattle trucks, or the full fare be charged to and fro. It is, though, very clear that the Suffolks must come again in more force, or the class will necessarily drop through. There was some complaint of the cart horses being calf-kneed; but Professor Varnell, who performed his duties with an ability and good taste, upon which we can honestly compliment him, reports very favourably on the heavy classes, as indeed he does of the whole horse show, in regard to the important matter of soundness. In the open class of cart horses there was only one roarer; neither were flat-feet nor other defects very numerous. Of the dray stallions there was again but one roarer, but more tendency to flat brittle fore feet; while the Suffolks were remarkably exempt from all diseases, their feet being very good, and the chief failing of the cheanots a tendency to smallness below the knee. The Professor's report is, in fact, an address of congratulation on the absence of hereditary diseases amongst all the classes of horses, especially the sires, be they race-horses, hunters, ponies, or cart-horses; a gratifying result which he very fairly attributes to the preliminary examination

now insisted upon, and that one or two very active members of Council have done everything in their power to abolish ever since so wholesome a system was first instituted. It is said, indeed, that one man still threatens an annual motion on the subject!

Professor Simonds was enabled to report as favourably of the freedom of the cattle from disease, as his brother-professor of the horses; but amongst the pigs there were many disqualifications, attributable, however, rather to the trickery of the exhibitors than to any actual ill in the animals themselves. These were entered under, or even over their proper age, just as it suited, and ingenious were the devices adopted to make up a prize pen of sow and pigs. The Yorkshiremen were the chief offenders, but one well-known breeder from the Eastern Counties was also found, to use the mild phrase of the inspector, to be extremely "careless" about the due record of weeks and months, and he suffered accordingly. The show, on the whole, was a fair one, though by no means generally good, the great feature of the different divisions being the Berkshires, which came again in immense force, and furnished the best entry of this breed ever yet brought together. The sow class was generally commended; whilst, beyond the capital pigs of Messrs. Hower, Sadler, Hitchman, and others, these classes were materially strengthened by Mr. Joyce, of Waterford, whose Berkshires we have so often had to commend in our notice of the Irish shows. He had six young boars of the same litter, that for uniform excellence have seldom been surpassed, and one of which took a prize, three more being highly commended, and the two others commended. The small white pigs were also very evenly good; and the judges had a deal of difficulty in placing the boars of this division, the companion-lot of sows being equally creditable to their class. The small blacks, on the contrary, made nothing like the sensation they did at Battersea; and the supplementary compliments amongst them did not extend beyond a couple of commendations. The large boars were indifferent, and the competition limited; but the large sows, though few in number, were a capital lot, and Mr. Wainman's Fresh Hope, bred by Messrs. Hay, of Beamsley, an extraordinary animal for size, symmetry, and quality combined. The pens of three of almost any breed rarely ranked above mediocrity, and we did not meet with any of those wonderful match lots, or trio of Graces, that one comes occasionally across when Mr. Mangles is just in the vein. With Birmingham so handy, and Bingley Hall so famous in this way, the Worcester Pig show might have been better.

PRIZE LIST.

CATTLE.

SHORTHORNS.

JUDGES.—H. W. Beauford, Bedford,
G. Drewry, Holker, Newton in Cartmel,
J. Unthank, Nethercales, Penrith.

Bulls above three and not exceeding six years old.—First prize, 25*l.*, Jacob Wilson, Manor House, Woodhorn, Morpeth (Duke of Tyne). Second of 15*l.*, J. Charlesworth, Headfield, Dewsbury, York (General Murat). Third of Silver Medal, J. Brawn, Shelfield, Walsall, Staffordshire (Young Radford.) *Highly commended*: Lord Feverham, Duncombe Park, Helmsley, York (Vice-Chancellor). *Commended*: J. Bickford, Oxley, Wolverhampton (Duke of Manchester); and the Earl of Zetland, Aske, Richmond, York (Savile).

Bulls above two and not exceeding three years old.—First prize, 25*l.*, Viscount Hill, Hawkstone, Shrewsbury (Hemlock). Second of 15*l.*, Jonathan Peel, Knowlmore Manor, Clitheroe (Hengist). Third of Silver Medal, Colonel Charles Towneley, Towneley Park, Burnley (Lord Butterfield 10th). *Highly commended*: Sir Anthony de Rothschild, Bart., Aston Clinton, Tring (Sheriff). *Commended*: R. Stratton, Walls Court, Stapleton, Bristol (Windsor Castle); and G. Jones, Whitley Court, Upton St. Leonards, Gloucester (Captain Jones 2nd).

Bulls above one and not exceeding two years old.—First

prize, 25*l.*, R. Eastwood, Thorney, Holme Clitheroe (The Hero). Second of 15*l.*, Col. C. Towneley (Royal Butterfly 11th). Third of Silver Medal, W. Woodward, Northway House, Ashchurch, Tewkesbury (French Butterfly's Cœur de Lion). *Highly commended*: The Hon. Col. E. G. D. Pennant, M.P., Penrhyn Castle, Bangor (Earl of Darlington).

Bull Calves above six and not exceeding twelve months old.—First prize, 10*l.*, Sir Anthony de Rothschild, Bart. (Captain Cherry). Second of 5*l.*, G. Garne, Churchill Heath, Chipping Norton (Pizarro). Third of Silver Medal, J. Robinson, Clifton Pastures, Newport Pagnell, Bucks (Pretor). *Highly commended*: Sir Anthony de Rothschild, Bart. (Officer). *Commended*: R. E. Oliver, Sholebrooke Lodge, Towcester (Roving Butterfly); and J. R. Middlebrough, South Milford, York (Prince of Wales).

Cows above three years old.—First prize, 20*l.*, Lady Pigot, Branches Park, Newmarket (Pride of Southwicks). Second of 10*l.*, J. Lane, Barton Mills, Cirencester (Maid of Athens). *Highly commended*: Earl Spencer, Althorpe, Northampton (Vell).

Heifers in-milk or in-calf, not exceeding three years old.—First prize, 15*l.*, Lady Pigot (Roedale). Second of 10*l.*, R. Booth, Warblay, Northallerton (Queen of the May 2nd). Third of Silver Medal, Col. C. Towneley (Roan Knight's Butterfly). *Highly commended*: Col. C. Towneley (Royal Butterfly's Duchess); W. Butler, Badminton, Chippingham; E. Taylor, Manor Farm, Kingham, Chipping Norton, Trintek; E. Bowly, Sidington House, Cirencester (Musical); and J. Lane (Kiss and).

Yearling Heifers.—First prize, 15*l.*, Duke of Montrose, Buchanan Castle, Glasgow (Flower Girl). Second of 10*l.*, Col. C. Towneley (Frederick's Farwell). Third of Silver Medal, Lady Pigot (Castianira). *Highly commended*: Col. C. Towneley (Bampton Butterfly). *Commended*: J. N. Beasley, Brampton, Northampton (Janita 7th); J. Hull, Wharton Bank, Kirkham, Lancashire (Kent Cherry); and J. R. Middlebrough (Lady).

Heifer Calves above six and under twelve months old.—First prize, 10*l.*, D. McIntosh, Havering Park, Romford (Lady Oxford 5th). Second of 5*l.*, E. E. Oliver (Lalage 2nd). Third of Silver Medal, Col. C. Towneley (Royal Butterfly's Pageant). *Highly commended*: J. Hegan, Dawpool, Neston, Chester (Grand Duchess 13th). *Commended*: C. Howard, Biddenham, Bedford (Patina Gwynne); and Col. E. G. D. Pennant (Lively).

HEREFORDS.

JUDGES.—J. Coleman, Park Farm, Woburn,
E. L. Franklin, Ascott, Walingford,
J. E. Jones, Springfield, Breinton, Hereford.

Bulls above three and not exceeding six years old.—First prize, 25*l.*, J. H. Arkwright, Hampton Court, Leominster (Sir Oliver 2nd). Second of 15*l.*, T. Davies, Lady Meadow, Leominster (Plato). *Commended*: Lord Bateman, Shobden Court, Shobden (Golden Horn).

Bulls above two and not exceeding three years old.—First prize, 25*l.*, W. Taylor, Showle Court, Ledbury (Tambarine). Second of 15*l.*, W. C. Morris, Whitwick, Ledbury (Moderator). Third of Silver Medal, H. R. Evans, jun., Swanston Court, Dilwyn (Rodney). *Highly commended*: J. A. Hollings, How Caple, Ross (Chieftain 2nd). *The Class generally commended*.

Bulls above one and not exceeding two years old.—First prize, 25*l.*, T. Edwards, Wintercot, Leominster (Adforton). Second of 15*l.*, J. Baldwin, Luddington, Stratford-on-Avon (Battersea). Third of Silver Medal, E. Tanner, jun., Hopton Castle, Aston-on-Clun (Ballarat). *Commended*: G. Pitt, Chadnor Court, Dilwyn (San Jacinto).

Bull Calves above six and not exceeding twelve months old.—First prize, 10*l.*, T. Roberts, Ivington Bury, Leominster. Second of 5*l.*, E. Harcourt Capper, Northgate, St. Weonard's, Ross (Worcester). Third of Silver Medal, E. Wright, Halston Hall, Oswestry (David). *Highly commended*: E. Wright (Lion).

Cows above three years old.—First prize, 20*l.*, W. Perry, St. Oswald, Cholestray, Leominster (Beauty). Second of 10*l.*, T. Rea, Westbury, Pembridge (Kate 2nd). Third of Silver Medal, T. Duckham, Bayham Court, Ross (Delight). *Highly commended*: F. Turner, The Leen, Pembridge (Ursula). *Commended*: E. Laysdon, Island Farm, Bridgend (Welsh Lass); and G. Pitt (Cherry).

Heifers in-milk or in-calf, not exceeding three years old.—First prize, 15*l.*, W. Tudge, Adforton, Leintwardine (Lady Ashford). Second of 10*l.*, G. Pitt. *Highly commended*: Major-General the Hon. A. Nelson Hood, Cumberland Lodge, Windsor (Adela). *Commended*: T. Thomas, St. Hilary, Cowbridge (Laura); and J. Williams, St. Mary's, Kingland, Leominster (Rechem).

Yearling Heifers.—First prize, 15*l.*, J. Monkhouse, The Stow, Hereford (Clementine). Second of 10*l.*, T. Roberts (Duchess of Bedford 2nd). Third of Silver Medal, W. Perry (Lady Dappa). *Highly commended*: The Hon. Thomas Henry Noel Hill, Berrington, Shrewsbury (Petunia).

Heifer Calves above six and under twelve months old.—First prize, 10*l.*, T. Roberts (Miss Hastings 2nd). Second of 5*l.*, A. J. House Boughton Knight, Downton Castle, Ludlow (Lady Jane Grey). *Commended*: W. Perry (Young Lady Wellington).

DEVONS.

JUDGES.—H. W. Keary, Bridgnorth, Salop,
S. Umbers, Wappenburg, Leamington,
R. B. Warren, Child Okeford, Blandford.

Bulls above three and not exceeding six years old.—First prize, 25*l.*, S. P. Newbery, Scrusel Barton, Honiton (Prince Jerome). Second of 15*l.*, Walter Farthing, Stowey Court, Bridgwater (Viscount).

Bulls above two and not exceeding three years old.—First prize, 25*l.*, J. S. Surman, Swindon Hall, Cheltenham (Van Tromp). Second of 15*l.*, J. Merson, Brinsworthy, North Molton (Fusileer).

Bulls above one and not exceeding two years old.—First prize, 25*l.*, General Hood (Prince Alfred). Second of 15*l.*, J. A. Smith, Bradford Peverell, Dorchester (Constitution). *Commended*: C. F. Perkins, The Grange, Kingston, Taunton (Corporal).

Bull Calves above six and not exceeding twelve months old.—First prize, 10*l.*, George Turner, Beacon Downe, Exeter (The Drone). Second of 5*l.*, Walter Farthing. *Commended*: J. Wentworth Buller, M.P., Downe, Crediton; and George Turner (Trumpeter).

Cows above three years old.—First prize, 20*l.*, J. A. Smith (Rachel). Second of 10*l.*, Walter Farthing (Cheerful). *Highly commended*: General Nelson Hood (Hyacinth and Sweetbriar); J. A. Smith (Young Gold Drop); and George Turner (Stella). *The Class generally commended*.

Heifers in-milk or in-calf, not exceeding three years old.—First prize, 15*l.*, C. Hambro, Milton Abbey, Blandford (Lina). Second of 10*l.*, Walter Farthing (Jenny). *Commended*: C. F. Perkins (Alice).

Yearling Heifers.—First prize, 15*l.*, J. Wentworth Buller, M.P. Second of 10*l.*, George Turner (Devonensis). *Commended*: E. Pope, Great Toller, Malden Newton (Fancy 6th); and J. J. Farquharson, Langton House, Blandford.

Heifer Calves above six and under twelve months old.—First prize, 10*l.*, General Hood (Rose of Denmark). Second of 5*l.*, George Turner (Lady Audley). *Highly commended*: General Hood (Princess Helena), and J. J. Farquharson.

SUSSEX.

JUDGES.—S. Bloxidge, Warwick,
T. Harris, Stony Lane, Bromsgrove,
W. Fisher Hobbs, Boxted Lodge, Colchester.

Bulls above two and not exceeding six years old.—First prize, 10*l.*, W. Marshall, Bolney Place, Cuckfield (Prince Alfred). Second of 5*l.*, J. and A. Heasman, Angmering, Arundel (Viscount). *Commended*: E. Cane, Berwick Court, Lewes (Prince).

Bulls above one and not exceeding two years old.—First prize, 10*l.*, J. and A. Heasman (First Fruit). Second prize—*No further entry*.

Cows above three years old.—First prize, 10*l.*, Tilden Smith, Knell, Beckley, Staplehurst (Canterbury). Second of 5*l.*, J. and A. Heasman (Lily). *Highly commended*: E. Cane (Stimie). *Commended*: Tilden Smith (Blossom).

Heifers in-milk or in-calf, not exceeding three years old.—First prize, 10*l.*, J. and A. Heasman (Battersea). Second prize—*No competition*.

Yearling Heifers.—First prize, 10*l.*, to J. and A. Heasman (Preceptress). Second of 5*l.*, G. Jenner, of Parsonage House, Udimore (Twin Mayflower, No. 1).

OTHER ESTABLISHED BREEDS.

(Not including Shorthorns, Herefords, Devons, or Sussex.)

JUDGES.—As for Sussex.

Best Bulls above two and not exceeding six years old.—First prize, 10*l.*, J. Davis, Melcombe Horsey, Dorchester (Longhorn, Melcombe). Second of 5*l.*, Colonel E. G. D. Pennant (Welsh). Third, Silver Medal, J. Dumbrell, Ditchling, Hurstperpoint (Channell Islands, St. Heller). *Commended*: Sir E. Kerrison, Bart., M.P., Broome Hall, Scolle (Suffolk, Rifleman).

Bulls above one and not exceeding two years old.—First prize, 10*l.*, Sir Willoughby Jones, Bart., M.P., Cranmer Hall, Fakenham (Norfolk, Rufus). Second of 5*l.*, H. Le Fenore, Les Mismes, St. Peter's, Jersey (Jersey, Hero).

Cows above three years old.—First prize, 10*l.*, Sir E. Kerrison (Suffolk, Duchess of Suffolk). Second of 1*l.*, Sir Willoughby Jones (Norfolk, Hetty). Third, Silver Medal, Lord Sondes, Elmham Hall, Thetford (Norfolk, Crouse). *Highly commended*: Lord Sondes (Norfolk, Daisy). *Commended*: Hon. Colonel E. G. D. Pennant (Welsh); R. Cowan, Swissville, St. Peter Fort, Guernsey (Guernsey, Annie); The Rev. J. Hunter Gandy, Rectory, Castle Eaton, Fairford (Brimled, Battersea); A. de Gallais, La Mole House, St. Aubin, Jersey (Alderney); and J. Dumbrell (Channell Islands, Lavender).

Heifers in-milk or in-calf, not exceeding three years old.—First prize, 10*l.*, Sir E. Kerrison (Suffolk, Isabella). Second of 5*l.*, Lord Sondes (Norfolk, Rosette). Third, Silver Medal, Albert le Gallais (Alderney, Daisy). *Highly commended*: Sir E. Kerrison (Suffolk, Arabella); Albert le Gallais (Alderney,

Jersey Lass). *Commented*: Lord Sondes (Norfolk, Mayflower); the Earl of Powis, Powis Castle, Welshpool (Ayrshire, Lady Nithsdale).

Yearling Heifers.—First prize, 10*l*., Lord Sondes (Norfolk, Cherry). Second of 5*l*., Lord Sondes (Norfolk, Pink). Third, Silver Medal, Sir Willoughby Jones (Norfolk). *Highly commended*: Sir E. Kerrison (Suffolk, Plover 3rd).

HORSES.

JUDGES.—Hon. Colonel Cotton, Cherry Hill, Malpas, Charles Barnett, Stratton Park, Biggleswade, H. Thurnall, Royston.

Thorough-bred Stud Horses, having served mares during the season 1868, and best calculated to improve and perpetuate the breed of the sound and stout thorough-bred horse for general stud purposes.—First prize, 100*l*., W. Gulliver, Swalcliffe, Banbury (Neville, by Napier). Second of 25*l*., E. G. Simpson, Levant Bridge, Yarm (Cavendish, by Voltigeur). Third, Silver Medal, H. R. Phillips, Willesden Paddocks, Kilburn (Cambondo, by Orpheus). *The class highly commended*.

Stallions suitable for getting Hunters.—First prize, 25*l*., W. Barnett, Bays Hill Lawn, Cheltenham (Sir Peter Laurie, by The Saddler). Second of 15*l*., J. Batty, Mains Farm, Ripon (Elcot, by Venison). Third, Silver Medal, W. Watson, The Beauchorns, Cheltenham (Safeguard, by Safeguard).

Brood Mares, with foal at foot, or in-foal, for breeding Hunters.—First prize, 15*l*., J. Watson, Waresley, Kidderminster (Elyot, by Elyotus). Second of 10*l*., E. N. Hoygate, Buckland, Leominster (Whisky, by Windhound). Third, Silver Medal, Andrew Rouse Boughton Knight (Salt Fish, by Leander). *Commented*: James Gregg, Fencote, Docklow, Leominster (The Madley, by Safeguard).

JUDGES.—J. E. Bennett, Bosworth Grange, Rugby, J. Farrington, Brancepeth, Durham, J. E. Welby, Barrowby, Grantham.

Brood Mares, with foal at foot, or in-foal, for breeding Hackneys.—First prize, 15*l*., H. Percy, Bakridge, Wigton (Crafty, by The Judge). Second of 10*l*., S. W. Urwick, Leintall, Ludlow (Polly, by The Steamer).

PONIES.

Stallions, not exceeding 14 hands.—First prize, 15*l*., J. Moffat, Kirklington Park, Carlisle (Tom Sayers). Second of 5*l*., S. Edwards, Middleton Priors, Bridgenorth (Dick). *Commented*: W. Noman, Aspatria, Carlisle (Jack).

Mares, not exceeding 14 hands.—First prize, 10*l*., F. Branwhite, Chapel House, Long Melford, Suffolk (Pretty Lass). Second of 5*l*., T. Fulcher, Elmham, Thetford (Enid). Third, Silver Medal, J. Knight, Marlborough House, Newbury.

AGRICULTURAL AND DRAY HORSES.

JUDGES.—N. G. Barthropp, Hacheston, Wickham Market, T. Brooks, Fixby, Calster, Lincolnshire, R. Nisbett, Chalfont, St. Giles, Slough.

AGRICULTURAL.

(Not qualified to compete as Suffolk.)

Stallions foaled before the 1st of January, 1861.—First prize, 25*l*., J. Yeomans, Pennymore Hay, Sharnhall (Black Prince). Second of 10*l*., W. Kaine, Morton Timmuth, Darlington (Clydesdale, Young Clyde). Third, Silver Medal, The Duke of Marlborough, Blenheim Palace, Woodstock (Clydesdale, Culloden).

Stallions foaled in the year 1861.—First prize, 20*l*., W. Coney, Battenhall, Worcester. Second of 10*l*., W. Coney. Third, Silver Medal, E. Holland, M.F., Dumbleton Hall, Evesham.

Mares and Foals.—First prize, 20*l*., Elisabeth Bull, Weobley, Hereford (Jolly). Second of 10*l*., J. Corbett, Coventry Arms, Croome. Third of Silver Medal, E. Hurbert, Powick, Worcester.

Two Years Old Fillies.—First prize, 15*l*., C. Friday, Longford, Gloucester (Flower). Second of 10*l*., Colonel E. G. D. Pennant.

DRAY.

Stallions foaled before the 1st of January, 1861.—First prize, 25*l*., T. Johnson, Hatfield, Doncaster (Young John Bull). Second of 10*l*., to W. H. Neale, Old Eclipse Inn, Mansfield (Prince of London).

Stallions foaled in the year 1861.—First prize, 20*l*., C. Morrison, Basildon Park, Reading (Basildon). Second of 10*l*., J. Abell, Leopard Grange, Worcester (Crichton).

Best Mares and Foals.—First prize, 20*l*., G. Hasell, Barton Hill, Bristol (Black Bess). Second—No further entry.

Two Years Old Fillies.—No entry.

SUFFOLKS.

Stallions foaled before the 1st of January, 1861.—First prize, 20*l*., W. G. Roope, East Stockwell Street, Colchester (Duke). Second—No further entry.

Stallions foaled in the year 1861.—First prize, 15*l*., M. Mumford, Creeting St. Peter, Needham Market (Young Duke).

Second of 10*l*., Isaac Riet, Tattingstone, Ipswich (Young Emperor). *Highly commended*: W. Wilson, Baylham Hall, Ipswich.

Mares and foals.—First prize, 20*l*., Sir E. Kerrison (Bragg).

(Only one shown).

Two Years Old Fillies.—First prize, 15*l*., J. Ward, East Mersea, Colchester (Jewel). Second of 10*l*., M. Biddell, Playford, Ipswich (May Bird).

SHEEP.

LEICESTERS.

JUDGES.—F. Jordan, Eastburn House, Driffield, J. B. Thompson, Anlaby, Hull, R. Woods, Osberton, Worksop.

Shearling Rams.—First prize, 20*l*., Lieut.-Col. W. Inge, Thorpe Constantine, Tamworth. Second of 10*l*., W. Sanday, Holmes Pierrepont, Nottingham. Third of Silver Medal, W. Sanday. *Highly commended*: W. Sanday; J. Borton, Barton House, Barton-le-street, Malton. *Commented*: Col. Inge; W. Sanday; F. Spencer, Alma House, Claybrooke Magna, Lutterworth.

Rams of any other age.—First prize, 20*l*., J. Borton. Second of 10*l*., J. Borton. Third of Silver Medal, J. Borton. *Highly commended*: E. W. Creswell, Ravenstone, Ashby-de-la-Zouch. *Commented*: E. W. Creswell.

Pens of five Shearling Ewes, of the same flock.—First prize, 15*l*., Col. W. Inge. Second of 10*l*., W. Sanday. *Highly commended*: W. Sanday. *Commented*: Col. W. Inge.

COTSWOLDS.

JUDGES.—H. Aylmer, West Dereham Abbey, Stoke Ferry, T. Greetham, Stainfield, Wragby, H. Bateman, Asthally, Witney.

Shearling Rams.—First prize, 20*l*., R. Garne, Aldsworth, Northleach. Second of 10*l*., R. Garne. Third of Silver Medal, R. Garne.

Rams of any other age.—First prize, 20*l*., R. Garne. Second of 10*l*., T. Beale Browne, Salperton Park, Andoversford. Third of Silver Medal, E. Handy, Sierford, Cheltenham. *The class generally highly commended*.

Pens of five Shearling Ewes, of the same flock.—First prize, 15*l*., G. Fletcher, Shipton Sollars, Cheltenham. Second of 10*l*., W. Lane, Broadfield Farm, Northleach. Third of Silver Medal, R. Garne, Aldsworth, Northleach. *Highly commended*: G. Fletcher.

LINCOLNS AND OTHER LONG-WOOLLED.

(Not qualified to compete as Leicesters or Cotswold.)

JUDGES.—As for Cotswolds.

Shearling Rams.—First prize, 20*l*., J. Lynn, Church Farm, Stroxtan, Grantham (Lincoln and Leicester). Second of 10*l*., T. Cartwright, Dunston Pillar, Lincoln (Lincoln). Third of Silver Medal, J. Simpson, Spofforth Park, Wetherby (Longwool). *Highly commended*: Clarke Hales, Basingbourne, Royston (Lincoln).

Best Rams of any other age.—First prize, 20*l*., J. Lynn (Lincoln and Leicester). Second of 10*l*., J. Lynn (Lincoln and Leicester). Third of Silver Medal, T. B. Marshall, Branton, Lincoln (Lincoln). *Highly commended*: J. Simpson (Longwool).

Pens of five Shearling Ewes, of the same flock.—First prize, 15*l*., R. G. F. Howard, Temple Bruer, Lincoln (Lincoln). Second of 10*l*., T. B. Marshall (Lincoln). *Highly commended*: R. G. F. Howard (Lincoln).

SOUTHDOWNS.

JUDGES.—H. Fooks, Whitechurch, Blandford, H. Overman, Weasenham, Rougham, P. Purves, Brampton, Huntingdon.

Shearling Rams.—First prize, 20*l*., Lord Walsingham, Merton Hall, Thetford. Second of 10*l*., Lord Walsingham. Third of Silver Medal, Lord Walsingham. *Highly commended*: Lord Walsingham. *Commented*: Lord Walsingham.

Rams of any other age.—First prize, 20*l*., Lord Walsingham. Second of 10*l*., Lord Walsingham. Third of Silver Medal, Lord Walsingham. *Highly commended*: Lord Walsingham (for two other rams); and W. Ridgen, Hove, Brighton. *Commented*: the Earl of Radnor, Coleshill, Highworth, Wilts.

Pens of five Shearling Ewes, of the same flock.—First prize, 15*l*., Lord Walsingham. Second of 10*l*., J. and A. Heaman. Third of Silver Medal, J. J. Farquharson, Langton House, Blandford. *Highly commended*: the Earl of Radnor; and the Duke of Richmond, Goodwood, Chichester.

OXFORDSHIRE DOWNS.

JUDGES.—F. Budd, Hatch Warren, Charles Randell, Chadbury, Evesham, T. H. Saunders, Watercombe Farm, Dorchester.

Shearling Rams.—First prize, 20*l*., J. Bryan, Southleigh, Witney. Second of 10*l*., C. Gillett, Cote House, Hampton. Third of Silver Medal, J. Druce, Eynham. *Highly commended*: C. Gillett. *Commented*: G. Wallis, Old Shifford, Hampton; and G. H. Barnett, Glympton Park, Woodstock.

Rams of any other age.—First prize, 20*l*, G. Wallis. Second of 10*l*, G. Wallis. Third of Silver Medal, G. Wallis. *Commended*: G. H. Barnett.

Pens of Five Shearling Ewes, of the same flock.—First prize, 15*l*, C. Gillett. Second of 10*l*, the Duke of Marlborough. *Highly commended*: C. Gillett. *Commended*: C. Howard, Biddenham, Bedford; and C. Gillett.

SHERPSHIRE.

JUDGES.—As for Oxfordshire Downs.

Shearling Rams.—First prize, 20*l*, J. Stubbs, Weston Hall, Stafford. Second of 10*l*, T. Horton, Harnage Grange, Shrewsbury. Third of Silver Medal, T. Horton. *Specially commended*: W. Orme Foster, Kinver Hill Farm, Stourbridge. *Highly commended*: Pryce W. Bowen, Shrawardine Castle, Shrewsbury; J. and E. Crane, Shrawardine, Shrewsbury (for two rams); W. Orme Foster (for another ram); and W. G. Preece, Shrewsbury. *Commended*: Pryce W. Bowen; and J. and E. Crane.

Rams of any other age.—First prize, 20*l*, Pryce W. Bowen. Second of 10*l*, Colonel Dyott, Freeford Hall, Lichfield. Third of Silver Medal, J. Coxon, Freeford, Lichfield. *Highly commended*: R. H. Masfen, Penderford, Wolverhampton. *Commended*: Lord Wenlock, Bourton Cottage, Much Wenlock; and T. Horley, Jun., The Fosse, Leamington.

Pens of Five Shearling Ewes, of the same flock.—First prize, 15*l*, J. and E. Crane. Second of 10*l*, J. and E. Crane. Third of Silver Medal, H. Matthews, Montford, Shrewsbury. *Highly commended*: J. H. Blackburne, Pipe-place, Lichfield; and W. Orme Foster. *Commended*: Colonel Dyott; and the Earl of Dartmouth, Patahull, Albrighton.

HAMPSHIRE AND OTHER SHORT-WOOLLED.

(Not qualified to compete as Southdowns or Shropshires.)

JUDGES.—As for Oxfordshire Downs.

Shearling Rams.—First prize, 20*l*, W. Humfrey, Oak Ash, Chaddleworth, Wantage (West-Country Down). Second of 10*l*, W. Humfrey. Third of Silver Medal, W. B. Canning, Elston Hill, Devizes (West-Country Down). *Commended*: J. Rawlence, Bulbridge, Wilton (West-Country Down).

Rams of any other age.—First prize, 20*l*, J. Rawlence. Second of 10*l*, W. Humfrey. *Highly commended*: W. Humfrey. *Commended*: W. B. Canning.

Pens of Five Shearling Ewes, of the same flock.—First prize, 15*l*, J. Rawlence. Second of 10*l*, J. Rawlence. *Specially commended*: J. Rawlence. *Highly commended*: W. R. Shittler, Bishopston, Salisbury; Stephen King, Brockhampton, Lambourn; W. B. Canning; and W. Humfrey.

PIGS.

JUDGES.—H. P. Jones, Portway House, Warrminster.

J. Moon, Marlstone, Plymouth.
J. S. Turner, Chyngton, Seaford.

Boars of a large breed, of any colour.—First prize, 10*l*, W. B. Wainman, Carhead, Croyshills (white). Second of 5*l*, R. Dickinson, 161, Old Road, Stockport (white).

Boars of a small white breed.—First prize, 10*l*, W. B. Wainman. Second of 5*l*, R. Berkeley, Spetchley Park, Worcester. Third of Silver Medal, G. Mangies, Givendale, Ripon. *Highly commended*: G. Mangies. *Commended*: T. Rea, Westonbury, Penbridge.

Boars of a small black breed.—First prize, 10*l*, T. Crisp, Batley Abbey, Wickham Market. Second of 5*l*, G. M. Sexton, Whersted Hall, Ipswich. *Highly commended*: G. M. Sexton.

Boars of the Berkshire breed.—First prize, 10*l*, W. Hewer, Sevenhampton, Highworth. Second of 5*l*, W. Hewer. Third of Silver Medal, W. Joyce, Abbey Farm, Waterford. *Highly commended*: W. Joyce; and W. Hewer (for two other boars). *Commended*: J. Smith, Henley-in-Arden; and W. Joyce (for two other boars).

Boars of breeds not eligible for the preceding classes.—First prize, 10*l*, W. B. Wainman (white). Second of 5*l*, J. Graham, Blackburn's Buildings, York Road, Leeds (white). *Highly commended*: W. B. Wainman (white).

Breeding Sows of a large breed, of any colour.—First prize, 10*l*, W. B. Wainman (white). Second of 5*l*, R. Dickinson (white).

Breeding Sows of a small white breed.—First prize, 10*l*, T. Crisp. Second of 5*l*, Sir E. Kerrison. Third of Silver Medal, S. G. Stearn, Brandston, Wickham Market. *Highly commended*: W. B. Wainman; M. Gavins, Fox Inn, Leeds; and the Earl of Radnor, Colehill, Highworth, Wilts. *Commended*: S. G. Stearn.

Breeding Sows of a small black breed.—First prize, 10*l*, T. Crisp. Second of 5*l*, G. M. Sexton. Third of Silver Medal, W. Hemming, Coldicott, Moreton-in-Marsh. *Highly commended*: T. Crisp.

Breeding Sows of the Berkshire breed.—First prize of 10*l*, W. J. Sadler, Bentham, Calcutt, Crickeade. Second of 5*l*, J. Hitchman, M.D., Mickleover, Derby. Third of Silver Medal, Royal Agricultural College, Cirencester. *Highly commended*: A. Stewart, St. Bridge Farm, Gloucester; and G. M. Allender, Lee Grange, Winslow. *The class commended*.

Breeding Sows of a breed not eligible for the preceding classes.—First prize, 10*l*, T. Crisp (white). Second of 5*l*, W. B. Wainman (white). Third of Silver Medal, W. B. Wainman (white).

Pens of Three Breeding Sow Pigs of a large breed, of any colour, of the same litter, above four and under eight months old.—First prize, 10*l*, W. B. Wainman (white). Second of 5*l*, R. E. Duckering, Northorpe Station, Kirtton Lindsey (white).

Pens of Three Breeding Sow Pigs of a small white breed, of the same litter, above four and under eight months old.—First prize, 10*l*, J. Waters, Motcombe, Eastbourne. Second of 5*l*, Colonel E. G. D. Pennant, M.P. *Highly commended*: Major-General the Hon. A. Nelson Hood.

Pens of Three Breeding Sow Pigs of a small black breed, of the same litter, above four and under eight months old.—First prize, 10*l*, G. M. Sexton. Second of 5*l*, W. Hemming.

Pens of Three Breeding Sow Pigs of the Berkshire breed, of the same litter, above four and under eight months old.—First prize, 10*l*, W. Joyce, Abbey Farm. Second of 5*l*, J. Smith, Henley-in-Arden. Third, Silver Medal, W. J. Sadler, Bentham.

Pens of Three Breeding Sow Pigs of a breed not eligible for the preceding classes, of the same litter, above four and under eight months old.—First prize, 10*l*, W. B. Wainman (white). Second of 5*l*, H. Keyworth, Woodhouse Moor, Leeds (white).

PRIZES OFFERED BY THE WORCESTER LOCAL COMMITTEE.

CATTLE.

SHORTHORNS.

Pairs of Cows, in-milk, exceeding four years old.—First prize, 15*l*, R. Booth (Queen of the Ocean and Soldier's Bride). Second of 5*l*, J. H. Langston, M.P. (Dandelion and Meretrix).

Pairs of Heifers, in-milk and in-calf, not exceeding four years old.—First prize, 15*l*, J. R. Middlebrough. Second of 5*l*, W. Bradburn, Hulton, Wolverhampton (Flora and Snowdrop).

Pairs of Heifers, in-calf, not exceeding three years old.—First prize, 15*l*, R. Booth (Graceland and Lady Joyful). Second of 5*l*, Earl Beauchamp, Madresfield Court, Great Malvern (Princess Royal and Sunshine).

Pairs of Yearling Heifers.—First, 10*l*, Colonel C. Towneley (Double Butterfly and Perfume).

Bull, Cow, and their Offspring, the latter not exceeding twelve months old on the 1st July, 1863; the Cow bred by the exhibitor.—First prize, 20*l*, R. Stratton, Walls Court, Stapleton, Bristol (Knight of the Lagan, Lady Linda, and calf). Second of 10*l*, J. H. Langston (Lord of the Harem, Sally, and Harem's Select).

HEREFORDS.

Pairs of Cows, in-milk, exceeding four years old.—First prize, 15*l*, J. Walker, Westfield House, Holmer, Hereford (Alice Grey and Nell Gwynne). Second of 5*l*, P. Turner (Jewel and Juliet). *Commended*: G. Pitt (Perfection and Stately).

Pairs of Heifers, in-milk or in-calf, not exceeding four years old.—First prize, 15*l*, the Executors of the late J. Rea, Monmouth, Knighton (Diana 2nd and Spangle 2nd). Second of 5*l*, H. R. Evans, Jun (Nelly and Stately 2nd).

Pairs of Heifers, in-calf, not exceeding three years old.—No entry.

Pairs of Yearling Heifers.—No entry.

Bull, Cow, and their Offspring, the latter not exceeding twelve months old on the 1st July, 1863; the Cow bred by the exhibitor.—First prize, 20*l*, T. Roberts (Sir Thomas, Prize Flower Page, and heifer calf). Second of 10*l*, H. Gibbons, Hampton Bishop, Hereford (Shamrock 2nd, Prettymaid, and calf).

PEMBROKES.

Bull, and a Cow in-milk.—No entry.

Bull, and a Cow in-milk, of any other Welsh breed.—First prize, 10*l*, R. H. Harvey, Harroldstone, Haverfordwest (Anglesay—Ap Shenkin, Annie Laurie, and calf). Second prize—no further entry.

SCOTCH.

Bull, and a Cow in-milk, of any pure Scotch breed.—First prize, 10*l*, The Earl of Powis (Ayrshire—Irvine, Bonny Jean, and calf). Second prize—no further entry.

HORSES.

JUDGES.—C. Barnett,
Colonel Cotton,
H. Thurnall.

Mares or Geldings, exceeding four years old, equal to 15 stone with hounds.—First prize, 20*l*, J. B. Booth, Killierby, Catterick (Beechwood). Second of 10*l*, J. G. Watkins, Woodfield, Droitwich (Elastic). *Highly commended*: J. G. Watkins (Endurance), and W. H. Jones, Canon Bridge, Hereford. *The class generally commended*.

JUDGES.—J. E. Bennett,
J. Farrington,
J. E. Welby.

Fillies or Geldings, three years old, likely to make hunters or

carriage horses.—First prize, 10*l.*, H. J. Sheldon, Brailles House, Shipston-on-Stour (Harold). Second of 5*l.*, J. White, Lindoes, Coleford (Brunette).

Fillies or Geldings, two years old, likely to make hunters or carriage horses.—First prize, 10*l.*, W. Baker, Brailles, Shipston-on-Stour (Grafton). Second of 5*l.*, H. Allsop, Hindlip Hall, Worcester (Parvenue).

Cobs, not exceeding fifteen hands in height, or six years in age.—First prize, 10*l.*, F. Branwhite, Chapel House, Long Melford, Sudbury (Quicksilver). Second of 5*l.*, F. Branwhite (Tam O'Shanter).

AGRICULTURAL.

Stallions (Suffolk breed only exclude!) exceeding three years old and not exceeding seven years old.—First prize, 40*l.*, J. Miles, Astwood Claines, Worcester (Iron Duke). Second of 30*l.*, J. Crump, Crafton, Beckford, Tewkesbury (Young Wax Work).

SHEEP.

RYELANDS.

Yearling Rams.—Prize, 10*l.*, J. B. Downing, Holme Lacey, Hereford.

Pen of Five Theaves, of the same flock.—Prize, 10*l.*, J. B. Downing.

WELSH, OR ANY OTHER MOUNTAIN BREED.

Two-Shear Rams.—Prize, 10*l.*, Jonathan Peel (Lonk).

Pens of Five Theaves, of the same flock.—Prize, 10*l.*, Jonathan Peel (Lonk). *Highly commended:* Jonathan Peel (Lonk).

PIGS.

LARGE BREED.

Boar, Sow, and their Litter of Pigs, not exceeding six months old.—Prize, 10*l.*, W. B. Wainman (white).

SMALL BREED.

Boar, Sow, and their Litter of Pigs, not exceeding six months old.—First prize, 10*l.*, T. B. Stead, 20, Upperhead Row, Leeds (white). Second of 5*l.*, J. A. Smith (black, Dorset).

STEWARDS OF STOCK.

Mr. T. Pain, Laverstock Hall, Salisbury.

Mr. R. Milward, Thurgarton Priory, Southwell, Notts.

Mr. J. D. Dent, M.P., Ribston Hall, Wetherby.

Mr. Walter Flower, Netton, Wilts (Assistant Steward).

VETERINARY INSPECTORS.

Professor Varnell, for Horses.

Professor Simonds, for Cattle.

ASSISTANT INSPECTOR, R. L. Hunt, Birmingham

IMPLEMENTS.

STEAM CULTIVATORS.—CLASS 1.

JUDGES.—H. B. Caldwell, Lackham House, Chippenham,

William Owen, Rotherham,

C. Sewell Read, Plumstead House, Norwich,

Jacob Wilson, Manor House, Woodhorn, Morpeth.

The Gold Medal and First prize of 30*l.*, John Fowler, Cornhill, London, and Leeds, for 14-horse set of steam ploughing machines, complete.

Second of 20*l.*, Savory and Son, Tewkesbury, for two 10-horse self-propelling winding engines.

Third of Silver Medal, W. Stevens, Godolphin Road, Hamersmith, for four-furrow steam plough and cultivator combined.

Commended.—Coleman and Sons, Chelmsford, for set of steam cultivating apparatus.

STEAM CULTIVATORS, FOR SMALL OCCUPATIONS.—CLASS 2.

First prize, 35*l.*, John Fowler, for 10-horse set of steam ploughing machinery, complete.

Second of 15*l.*, William Smith, Woolston, Bletchley, for 10-horse set complete of steam ploughing machinery.

Third of 10*l.*, J. and F. Howard, Bedford, for 10-horse set complete of steam ploughing machinery.

THRASHING AND FINISHING MACHINES.

JUDGES.—W. Chalcraft, Bramshot House, Liphook.

J. Hicken, Bourton, Rugby.

G. Martin, Wydelands, Thorney, Peterboro'.

PORTABLE COMBINED THRASHING MACHINES.

First prize of 25*l.*, Hornsby and Sons, Grantham.

Second of 15*l.*, Clayton and Shuttleworth, Lincoln.

Third of 10*l.*, Wallis, Haslam, and Stevens, Basingstoke.

Commended: Robey and Co., Lincoln, and Holmes and Son, Norwich.

FIXED COMBINED STEAM THRASHING AND FINISHING MACHINES.

The prize of 20*l.*, Hornsby and Sons.

METHOD OF BAUGHING CHAFF IN A PORTABLE COMBINED THRASHING MACHINE.

Silver Medal, Holmes and Son.

STEAM ENGINES.

JUDGES.—D. K. Clarke, 11, Adam Street, Adelphi, London.
J. V. Gooch, Reform Club, Pall Mall, S.W.
J. Stewart.

PORTABLE.

First prize of 10*l.*, Hornsby and Sons.

Second of 9*l.*, Tuxford and Sons, Boston.

Third of 8*l.*, Barrett, Exall, and Andrews, Reading.

Fourth of 7*l.*, Clayton and Shuttleworth.

Fifth of 7*l.*, Clayton and Shuttleworth.

Sixth of 4*l.*, Tuxford and Sons.

Seventh of 4*l.*, Barrett, Exall, and Andrews.

Eighth of 1*l.*, Holmes and Sons.

Commended: Brown and May, Devizes; J. Haywood, jun., Derby; Ellis and Sons, Oswestry; G. Parsons, Martock; and Brown and May.

FIXED.

A prize of 15*l.*, Barrett, Exall, and Co.

A prize of 15*l.*, Clayton and Shuttleworth.

A third of 10*l.*, Hornsby and Sons.

Highly commended: J. Ferrabee, Stroud.

HAND DRESSING MACHINES.

JUDGES.—G. M. Hipwell, Cheam,
Rev. A. Riggs, College, Chester.

First prize, 15*l.*, J. Cooch, Harleston, Northampton.

Second of 10*l.*, W. Sawney, Beresley.

Third of 5*l.*, Hornsby and Sons.

CORN SCREENS.

First prize, 6*l.*, Penny and Co., Lincoln.

Second of 4*l.*, R. Boby, Bury St. Edmunds.

BARLEY HUMMELLERS.

First prize, 3*l.*, Barrett, Exall, and Andrews.

Second of 2*l.*, R. Boby.

MISCELLANEOUS.

Silver Medals to Amies and Barford, Peterborough, for wrought-iron water ballasting roller.—H. Mackinder, Lincoln, for potato separator.—E. Humphries, Pershore, for portable clover machine.

Commended.—Wallis, Haslam, and Stevens, for patent steering apparatus attached to drill.—Clarke and Son, Brackley, for adjustable scythe.—A. W. Gower and Son, Market Drayton, for combined corn distributor.—W. S. Underhill, Newport, Salop, for cheese press.—Seaman and Tipping, Worcester, for "Excelsior" steel whippetrees.—Hornsby and Sons, for root pulper.

STEWARDS OF IMPLEMENTS:

Sir A. K. Macdonald, Bart., Woolmer Lodge, Liphook, Hants.

Mr. W. Torr, Aylesby, Great Grimsby, Lincolnshire.

Sir E. C. Kerrison, Bart., M.P., Brome Hall, Scole, Norfolk.

Mr. J. H. Arkwright, Hampton Court, Leominster (Steward Elect).

CONSULTING ENGINEERS:

Easton and Amos, Grove, Great Guildford-street.

DIRECTOR OF THE SHOW AND GENERAL ARRANGEMENTS:

Mr. Brandreth Gibbs, Half Moon-street, Piccadilly.

PRICE OF FARM STOCK 100 YEARS AGO.—It may interest your readers to be informed of the price of farm stock in this district, exactly 100 years ago, as taken from a copy of "the account of the roup and sales of horse, nolt, and sheep, belonging to Wm. Elliot, of Tarras, exposed to sale at Broadlee, June 8th, 1763." The list is taken from an account of the sales which belonged to Mr. Thos. Winthrop, town clerk of Hawick at that period. According to the first article of sale, "Every offer shall exceed the immediate preceding offer one penny sterling upon each sheep, and one shilling sterling upon each horse or nolt." The sheep stock was exposed in lots varying from 20 to 100; and brought the following average prices per head: 722 ewe and lambs 7*l.* 9*d.* 96 gimmers 5*l.* 10*d.*, 598 dinmonds 7*l.* 8*d.*, 1050 hogs 5*l.* 6*d.*, 257 cild ewes 6*l.*, 19 tups 6*l.* 10*d.*, 47 wedders 4*l.* 9*d.*, 517 ewes, gimmers, and lambs 8*l.*, 7 cows and calves £4 12*s.*, 6 do. single £4 15*s.*, 15 stots £2 14*s.*, 4 oxen £2 17*s.*, 18 queys £2 17*s.*, 17 stirks 17*s.* 8*d.*, 1 bull £5 1*s.*, 8 horses £3 16*s.*—*Kelso Mail.*

THE INTERNATIONAL AGRICULTURAL MEETING AT HAMBURGH.

The Battersea International Show has already had its effect upon the Continent; and the German States have been the first to move. A guarantee fund of £10,000, by fifty-seven persons, first gave the key-note, and the project was set going in October last. The Executive Committee comprised six merchants, three farmers, and one dealer, with the famous Baron Merck as President; Mr. Olde, the dealer, and Messrs. Bieber and Ross, farmers, having also been very active. The show-yard covers 1½ million square feet. The total cost of holding the Exhibition will not be less than £20,000. All the German States, Austria, France, Sweden, America, Denmark, Switzerland, Holland, and Belgium are represented by Commissioners: these work by executive committees. The lamented death of Baron Merck cast a sad gloom over the proceedings; but General-Consul Schanseeback undertook the office of President. These committees have been ably assisted by the General Agricultural Society of Germany; and Baron Nathasius, their President, who was one of the first to secure English animals for the Continent, is well known on this side the water.

Hamburg, at once selected as the site for the meeting, is built on a square English mile of ground, with a population of 200,000 inhabitants. The whole of the Hamburg territory does not amount to more than 33 square miles; but it has to keep 72 English miles of river in a navigable order, surrounded by foreign states, that try to strangle them through toll-bars: and in spite of this they have been able to work themselves up, without marine or military forces or diplomacy. According to the statement of an English newspaper—viz., the *Globe*, 1853—Hamburg (since improved) is the third town for import, and the fourth for export, in the world. Hamburg, before 1842, was composed of narrow streets; but the memorable fire of that year swept away a fifth of the city, which has been built up again in ten years, with palaces and fine wide streets. Every step you make in these streets gives you the impression of a really wealthy town, built by a generation that shows as much taste in architecture as spirit and understanding. As a monument, they are building a church in the English Gothic style, designed by Mr. Scott, of London, that will be one of the finest in the North of Europe. The suburbs and immediate neighbourhood, round the banks of the Alster, are garnished with the finest villas and gardens, which you may count by hundreds, and scarcely see two houses alike. Englishmen who visit this place use the expression, "This is a paradise." The Alster, an artificial lake, raised eleven feet higher than the Elbe, has a good supply of fresh water from a large extent of country lying to the north-east. It empties itself into the Elbe at the back of the famous English Hotel, from the "summer-house" of which you see the falls of the water.

The show-yard was within an easy distance of the city. On entering, you could not fail to be impressed with the importance of the gathering. A tastefully-arranged lake, with a fountain in the centre adorned with flowers, &c., backed by an ornamental pavilion for the band, first caught the eye; while in the distance stood the working offices and refreshment rooms, supported around by the exhibition classes and implements. The varied costumes, the many tongues, the several characteristics of the many breeds of stock, coupled with fine weather and the novelty

of an international gathering in the German States, had its effect upon the visitors. These were numerous and distinguished; but it was singular to remark the absence of the English aristocracy, the leading breeders, and, we may even write, nearly every body else, except the officials. The Royal Agricultural Society was represented almost alone by Sir W. Watkin Wynn—the breeders by Mr. Crisp, of Butley Abbey; Mr. Sexton, of Suffolk; and Mr. Woods, as Lord Walsingham's agent. Nevertheless, England was tolerably well represented by her animals. Amongst the Continental supporters of the show present were the Duke of Mecklenburg-Schwerin and his brother; Prince Frederic of Hesse-Cassel; Duke of Holstein and two Princes of Holstein; Duke of Cobourg; Prince Esterhazy; Duke of Rappin; King of Prussia's Master of the Horse; Baron Sporken, Master of Horse to the King of Hanover; H. Von Nathusius, of Hundsburg, Prussia; Baron Malzahn, Mecklenburg; Baron Biel, Mecklenburg; Baron Schlippenbach, Mecklenburg, and from all the German States; Count Daneskiold, Denmark. Their attendance at the races on Saturday, Sunday, and Monday, gave another stimulus to the gathering. They were held at Wandsbeck, about four miles out of the city, with six or seven races each day, and a steeple-chase on the last day. The course was excessively crowded, and patronized by all the nobility and sporting men on the Continent. The flat races were all won by horses well known in England; but some of the gentlemen-riders might have taken a lesson both in riding and dressing from Captain White, Captain Little, and other English performers. The professional jockeys, with one exception, were all English. The races were well contested; one of them was cleverly won by Aldcroft on the post.

Proceeding now from the course to the show-ground, we may begin by saying that as it is difficult to follow the classification as arranged by the committee of management, we must make our remarks as general as possible. *Impria*, the English exhibitors of sheep ran great risk of being without a representative or a judge, for no person was appointed to act in this department. It was, however, preliminarily arranged that Mr. Robert Smith, of Emmett's Grange, should officiate, both for English cattle and sheep. The Merinos stand first in the catalogue, and are classified as rams and ewes with fine wool, and rams and ewes of coarser or different descriptions of wool. It must be understood that in each class of sheep animals of all ages are exhibited, and not as at the English exhibitions, where there are classes for rams of one year old, and others for rams of any age. The entries were as follows—

	165 Merino rams of fine wool.	
	103 Pens of 3 ewes do.	
224	193 Rams of coarser wool.	
	37 Do. do. in another class.	
	94 Do. do. do.	
	823 Pens of 3 ewes do. do.	
	50 Southdown rams bred in England and Scotland.	
	120 Pens of 3 Southdown ewes do. do.	
	32 Southdown rams bred on the continent.	
	21 Pens of Southdown ewes do. do.	
	14 Shropshire or other short-wooled rams.	
	12 Pens of 3 ewes do. do.	

- 20 Leicester rams bred in Great Britain or Ireland.
 46 Pens of 3 Leicester ewes do. do.
 6 Leicester rams bred on the continent.
 21 Pens of 3 Leicester ewes do. do.
 100 Cotswold or Lincoln rams bred in Great Britain or Ireland.
 177 Pens of 3 do. ewes do. do.
 10 Long-woolled rams bred on the continent.
 35 Pens of 3 do. ewes do. do.

The exhibition of Merino sheep is undoubtedly the largest ever held, and of this breed there are many excellent specimens. We can almost think we observe an increase of size and an increasing weight of wool: whether this is done by a more careful selection of the animals bred from, or by a distant dash of some other breed, we are unable to say; but we certainly do observe not only this increase in size, in many of the animals, but that unerring test, the hand, tells us of more mutton and of better quality than we generally used to find. We hold that it is a matter for serious consideration with our foreign friends whether they will confine themselves to the production of wool alone, or endeavour to produce a more profitable carcase at the same time. If this be done, we think that the Englishman's laugh at a foreign chop or leg of mutton will pass into oblivion. That the international exhibitions are calculated to remove much prejudice admits of no doubt; as for instance Lord Walsingham's best Southdown ram was sold for 100 guineas to Baron Maginas, of Saxony, and the second prize sheep was immediately afterwards sold at a high price to Baron O. Hedengren for the Swedish Government. Other sales followed in quick succession, and when we left the yard only three of Lord Walsingham's sheep remained unsold. We gathered the following figures:

First prize yearling Southdown ram	...	100 gs.
Second do. do.	...	50 gs.
Second do. (at Yarmouth)	...	60 gs.
No. 18	...	40 gs.
Shearling	...	46½ gs.
Little sheep	...	35 gs.
Nine shearing ewes	...	180 gs.

The unsold sheep were above an average, for one of which 80 guineas was refused. The Merton flock received all the prizes. The Yarmouth first prize shearling again stood A1, but the second at Yarmouth had to succumb to the third. The ewes fairly staggered the German flock-masters, showing that good and fine wool could be produced on large carcasses. Good specimens of the Babraham flock were exhibited by Mr. Taylor, of Harptree Court, Somerset, who was commended for his shearing ewes, which were placed third in their class.

Specimens were also sent from the Goodwood flock, and exhibited by Mr. Gibbard, of London. The two pens of ewes were pretty, well-made sheep, of nice character and quality; they received a commendation from the judges, as also did several sheep exhibited by Messrs. Crisp and Sexton from Suffolk, Heaseman from Sussex, Smith of Hull, and from Lord Sondes' flock. Many of the sheep were exhibited in their wool, which at once created an unfair test as to qualities against the shorn ones, and in one instance the judges had considerable difficulty as to naming their reserved number. Several of the sheep exhibited, especially those in the wool, suffered immensely from the heat and fatigue of their journey. Lord Walsingham lost a capital ram worth 70 guineas, Mr. Crisp another ram, and Mr. Taylor his best yearling ram, before being judged—a pure Webb, and brother to the ewes. The Duke of Richmond's ewes, as also others of Messrs. Crisp and Sexton, sold well. Of the Southdowns bred on the Continent, we may mention those exhibited by G. Zœppritz, Würtem-

berg, Baron Nathusius, Baron Magnus, of Drehsa. These were the most successful flocks, and carried away the prizes. They are descended from the Babraham sheep, and were really fair specimens of what may be done; but there was a sad falling off in others—in fact, some exhibitors had no previous opportunity of knowing what an English Southdown ought to be. This type, however, has been strongly impressed upon them at last by means of the International Meeting, where they have had the true Southdown placed before them, and from which a future trade must spring. The judges of sheep bred in Great Britain and Ireland, as also for the English breeds bred upon the Continent, were: Robert Smith, Emmetts Grange, England; Amtmann Blomeyer, Prussia; M. Dohrn, Holstein; Von. Schönermark, Silesia; Etata-rath Tesdorpf, Denmark; Ober-Amtmann Zimmermann, Prussia. This was a novel selection from the different Continental Countries, and Mr. Smith must have had enough on his hands to protect his country, and this through an interpreter.

AWARD OF PRIZES.

Southdown Rams.—First and second, Lord Walsingham, Merton Hall, Norfolk.

Southdown Ewes.—First and second, Lord Walsingham; third or reserved, Mr. Taylor, Harptree Court, Somerset.

Southdown Rams bred on the Continent.—First G. Zœppritz, Wirtemberg, bred from Messrs. Webb and Foljam's flocks; second, Baron von Nathusius, Prussia, bred from the Babraham flock; third or reserved, G. Zœppritz, Wirtemberg.

Southdown Ewes bred on the Continent.—First, G. Zœppritz, Wirtemberg; second, Baron von Nathusius.

The Classes open to other Shortwoolled Breeds from Great Britain were pretty well contested. First, for rams, was awarded to Mr. Guerrier, London, for his Oxford Down, of capital form and quality; the second went to a very fair specimen of West Country Down, bred by Mr. Humphrey, Oak Ash, Berks. Mr. Druce of Eynsham also exhibited some good specimens in this class; but as they possessed heavy fleeces, upon large frames, the five foreign judges completely upset Mr. Smith, and would "go in" for animals that possessed more of the Down qualities.

For Shortwoolled Ewes, not being Southdowns, there were only three entries, but these were sufficient to represent their qualities. Mr. Humphrey's West Country Downs were first; Mr. Merton's Hampshire second; and Baron von Laffert, Mecklenburg-Schwerin, highly commended.

The Leicesters from England and Scotland were pretty good. Mr. Groves, Kirk Hammerton Lodge, Yorkshire, received the first prize, and honourable mention as third, for two good animals; the second went to Mr. Smith, Hull, for a ram bred by Mr. Fisher, Beverley. Lord Kinnaird, Scotland, had also some useful sheep in this class.

Leicester Ewes from Great Britain (7 pens).—Lord Kinnaird, Rosie Priory, Perth, distanced all competitors: they were descended from the old Burley-on-the-Hill flock, and quickly placed by Mr. Smith as A 1: these were fine specimens, and had kept their quality and form well up to the good old age of five and six-shear ewes; the second went to Mr. Smith, Hull. Mr. Grove's ewes from Yorkshire were highly commended.

Leicesters bred on the Continent.—These were but moderate sheep, and by no means recognized by us as approaching the English Leicester; but the money was distributed.

Lincoln Sheep bred in England.—Here we had a tolerable muster from the flocks of Messrs. Marshall, of Branstons, Lincoln; Kirkham, as exhibited by B. Heeneberg, Holstein; J. Clarke, of Long Sutton; and Merton's,

of London, by purchase "on spec." Amongst these were some splendid specimens of the Lincoln long-woolled breed from Mr. Marshall's flock, who would have had all the prizes but for the marked aversion of the foreign judges to heavy fleeces of wool. However, the English judge insisted upon his shearing receiving first honours, and found a second prize sheep amongst Mr. J. Clarke's. Mr. Marshall's two-shear was then placed as third best, and his ram hoggs, truly enveloped in fleeces of lustre wool weighing at least 20 lbs. each, were highly commended, and honourable mention made of their respective fleeces. Mr. Marshall also exhibited five fleeces in Department A., for articles of produce. These fleeces were minutely inspected and weighed by the authorities, who recorded them thus: three Lincoln hogg fleeces, very fine, weight 17 lbs. each; two fleeces from two-year-old sheep, very heavy and good, weighing 19 lbs. each. The length of the staples upon the ram hoggs shown in the classes was 18 inches, in broad flakes of a bright rich yellow lustre caste. Mr. Clarke's sheep were also good, especially his second prize ram. This sheep had a fair form, with good quality of wool and mutton.

Lincoln Ewes bred in England.—Here, again, Mr. Marshall topped the lots with a capital pen of shearing ewes, and had a second pen highly commended. The second prize was awarded to Mr. E. Merton's salesman, London, for a capital pen of young ewes bought and exhibited by him.

Cotswolds bred in England.—This breed was well represented by Mr. Sexton from Suffolk, Mr. Handy and Mr. R. Garr, Gloucestershire, as also by Messrs. H. Gebhard, London, Mr. E. Merton, London, Mr. Gibson, Scotland, who sent specimens for two purposes—to compete and for sale. Mr. Handy sent a magnificent old sheep, which at once was placed first; but we much doubt the wisdom of sending so fat an animal "over the sea." Mr. Robert Garne had two capital sheep in the yard—these were placed second and third. There was a good trade doing in Cotswolds. Mr. Sexton's three shearings were much admired, and commended by the judges.

Cotswold Ewes bred in England.—There were some fair specimens from Scotland. The first prize went to Mr. J. Gibson, Woolmer, Edinburgh—these were bred from the flocks of Messrs. Handy and Lane. Mr. Merton's young ewes received the second; Mr. Beale Browne, Salperton Park, Gloucestershire, commended. Mr. H. Gebhard, London, had some useful ewes in this class; Lord Kinnaid and Col. Olde, Hamburg, had also entries in this class.

Long-woolled Sheep of a Continental race.—These specimens were from the marsh lands of Holstein, and a few from Hanover. The Holstein race is of a large caste, standing immensely high, and known for their unrivalled produce in numbers at a birth. As an instance, we give a quotation from the catalogue, as exhibited by M. Dohrn, Damoufeth, Wiltermarsch, Holstein:

1 mit (ewe)	5 lämmern (lambs)	weiss (born)	3rd Jahr.
1 ditto	4 ditto	ditto	ditto
3 ditto	3 ditto	ditto	ditto

Thus, we saw eighteen lambs produced, and sucking their five dams—surely this is worthy the notice of the Acclimatization Society! M. Dohrn purchased two Cotswold rams for crossing this race, with a view to a more meat-producing element, and they really seemed in need of it—fancy five lambs to rear up! In the other classes for foreign sheep (not Merinos) we noticed pretty well every form, colour, and class of wool that could be thought of—some had horns. There were amongst them many well-intentioned breeds that might be most profitably improved by an infusion of English blood; but this would require great care, so as to maintain the family characteristic of the Continental breed. To enumerate the prize list would

be uninteresting to English taste. There were some interesting *cross bred* classes, resulting in a profitable return. In one instance the Cotswold ram and a Merino ewe had produced a prodigious animal with fair wool and feeding qualities. A cross between the Southdown and Merino also produced a capital animal, as did the cross between the Leicester and Merino. These were kindly furnished by Baron Nathusius as specimens of the crosses. They are severally designated: Cotswold-merino, Southdown-merino, and Leicester-merino. There is also a very good-looking sheep termed Diahley-merino; another named Lincoln-velmoe. These results tend to extend the international element and market for English rams—in fact they were much sought after; so much so that in some instances you would see quite a crowd round the English pens, and many of the crosses.

Average live weight of the three shearing ewes, as shown in the different classes, weighed for record on the suggestion of Mr. R. Smith:—

Lord Walsingham's Prize Southdowns	... 167 lbs. each.
G. Zoeppritz	" bred
on the Continent	... 155 "
Mr. Humphrey's West Country Downs	... 169 "
Mr. Smith's, Hull, Leicesters...	... 164 "
Mr. Marshall's Lincolns	... 260 "
Mr. Gibson's Cotswolds	... 192 "
M. Dohrn's Holstein ewe (with 5 lambs)	... 200 "
" " 5 lambs	... 84 "

The above is the new Hamburg weight, 100 lbs. of which is equal to 107 lbs. English.

These live weight returns convey *solid* information which may be readily turned into dead weights. Multiply by 5 and divide by 8, and you have a basis to work upon, which practice will quickly regulate according to the quality of the animal. Thus, a sheep weighing 200 lbs. alive, will weigh 125 lbs., nett, when dead. This experiment at once exposed the "unfair shorn" sheep, and placed the solid ones in their right position *Scales v. Tape*.

CATTLE.

Shorthorns bred in Great Britain and Ireland.

Amongst the bulls were some first-class specimens, such as First Fruits, Gamester, and Lord Lovell. These certainly left a mark upon the foreign mind, and were constantly surrounded by anxious inquirers—but, to their respective attendants, in an "unknown tongue." We need hardly name that First Fruits and Gamester were each first in their classes, and Lord Lovell second to Gamester. Lord Kinnaid's bull Honeydew—famous for his former laurels in the North—had great merit; indeed, he is a massive and well-formed animal, with fair quality. A bull by Royal Butterfly 8rd was second to First Fruits. Amongst the females Mr. Crisp was again foremost, with his first prize cow, second prize heifer, and a commendation. Mr. J. Groves, Kirk Hammerton, exhibited a white heifer of fine proportions, and received the first prize. Amongst the shorthorns bred on the Continent, were two prize bulls and a heifer descended from the Towneley herd. The Ayrshires were by no means good. There were some good types of the Galloway breed, which sold readily, and at high figures. These were chiefly from Forfarshire. Mr. Stewart's heifers from Aberdeen were very choice; but the leading animal was Mr. D. Smith of Leyshade's Ole Bull—a good one. French Charolaise (shorthorn) were not remarkable; in fact, they were scarcely represented. To enumerate all the Continental breeds of cattle, as here classified, would be tedious, and by no means profitable. They were much of the same order as those exhibited at Battersea, but not so choice. Some of them had been crossed with English bulls; these stood out as remarkable

specimens, in the midst of their leaner brethren. The most remarkable cross was with a shorthorn cow and a Zebu bull; another cross, pretty similar, was that with a Zebu cow and an Ayrshire bull. Next came the classes for working oxen, the most remarkable feature of the foreign section. They were shown in their harness, which was very picturesque, and they were of immense size, and in many respects represent a cross from the English breeds, especially the Sussex and Devon. This formed a pretty feature of the show.

What may be designated as "the business" part of the meeting, viz., the sale department, went off well. In addition to a clearance of all the English Southdown and Cotswold sheep, some few Lincoln and Leicester lots of pigs, and all the Galloway cattle, Lord Walsingham sold his second-prize bull Lord Lovell, and Mr. Crisp was just closing for Gamester. First Fruits was purchased by a company in the neighbourhood of Tonning, to be used by subscription. Several hundred Downs and other ewes were sold by salesmen and dealers. One party invested £2,000 in stock for sale at the show. Four Scots, bred by Mr. T. Lyell, fetched 500 guineas.

The pigs were numerous, and in many respects good. Messrs. Crisp and Sexton did well for Suffolk, in carrying away a "lot of prizes," while they sold their animals at high and remunerating prices. There was a great trade carried on amongst the "swine."

HORSES.

The strength of the horse department will be apparent when it is stated that there were no fewer than 513 entries, the greater part of which were present. These were divided into 36 classes, viz., thorough-breeds, Arabs, and half-breeds, bred on the continent; half-breeds bred in Great Britain and Ireland; Suffolks, and other horses for agricultural purposes, bred in Great Britain; agricultural horses bred on the continent; different classes for mares and geldings, for riding, &c., from one to five years old; ponies of different sizes, &c. &c.; indeed, far too numerous to mention in these hurried notes.

The entry for thorough-bred stallions included the well-known names of Hobbie Noble, Mainstone, Willie Wright, Vortex, Harlestone (by Cotherstone), Kingfisher, &c. &c. Of these "Vortex" took the first prize of 400 thalers, "Harlestone" obtaining second honours and 100 thalers; whilst Hobbie Noble's bent fore-legs prevented him from gaining more than a commendation. Next came the class of Arab stallions, containing several very clever animals, the winner, who comes from Mecklenburg, being 29 years old, and one of the most perfect specimens of his race. He gets a prize of 200 thalers. The second-prize Arab was ridden by Lord Raglan in the Crimea, and looks very different now to the wretched state he was in when he arrived at Mr. Mavor's yard after that campaign. The judges in the above classes were Count Walstein, Count Alvensleben Erxleben, and Mr. Weatherby, who had not much difficulty in making their awards, although we believe the latter would gladly have put Hobbie Noble in the place occupied by Vortex, but two against one carried the day. The first prize of 200 thalers in the class for half-bred riding-horses, bred in Great Britain, was taken by "St. Giles," a trotting horse, from Yorkshire, but now the property of Mr. C. Olde, of Hamburg. Mr. Holmes, of Beverley, gets the 2nd prize of 100 thalers for "North Star." The first prize of 100 thalers for the best brood mare for riding purposes is gained by the almost invincible "The Yore," who will not, however, again appear in an English show-yard, Mr. Crisp having been induced, for a consideration, to part with her to the Grand Duke of Mecklenburg. Much as we like to hear of distinguished foreigners buying our live-stock, we can but regret the loss to our country of so perfect an animal. Mr. Holmes gets the

first prize, 100 thalers, for a clever four-year-old riding mare, and Mr. C. Olde is second with a four-year-old by Bondholder, bred in England. Forty-four stallions bred on the continent are shown for riding purposes, many of them being thoroughbred and good looking. Forty brood mares for riding purposes are shown, several of them being exhibited, but not for prizes, by the Kings of Hanover and Wurtemberg, whilst an equal number in the two classes of three and four-year-old and one and two-year-old fillies are shown; although many of these animals are well bred and good looking, they nevertheless lack the substance we like to see in a class for "riding and hunting purposes." In the class for carriage horses bred in England, Mr. C. Olde takes first and second prizes for stallions; Mr. Groves, and Mr. Smith, of Marton Lodge, Yorkshire, respectively taking the first prize, 100 thalers, and second, 50 thalers, for their brood mares, and Mr. Holmes gets the first prize, 100 thalers, for his four-year-old daughter of Wild Hero. There were large entries of this class bred on the continent.

We come now to the horses for agricultural purposes, the judges being General-Major Graf von Wedel, Mr. N. G. Barthropp, and Major von Kronenfeldt. The first class in this section were Suffolks; and it is rather to be wondered at that the honour of representing that breed should have been left almost entirely to Mr. Crisp; but that he was fully equal to the task will be seen from the fact that he took nearly every prize, not only in the Suffolk class, but in the other classes in which it was eligible for a Suffolk to compete. The first prize, 100 thalers, was awarded to Mr. Wilson's three-year-old colt that took the third prize at Ipswich the other day, Mr. Crisp taking the second, 50 thalers, also for a three-year-old; "Marquis," sold last year to Baron Nathusius by Mr. Crisp, is highly commended; but we believe Mr. Barthropp would gladly have placed him first, but his colleagues considered it better to encourage a young one rather than give the prize to "Marquis" who at thirteen years old cannot be expected to get better. The first prize two-year-old at Battersea, now the property of Freiherr von Seccondorf, has not improved, and shows now unmistakably short ribs, which we do not remember to have observed last year. Mr. Crisp gets the first prize, 100 thalers, for a brood mare commended at Ipswich, and second prize, 50 thalers, for the first prize mare at Yarmouth. A daughter of Chester Emperor, from the dam of Conqueror, bred by Mr. Crisp, now belonging to Baron Nathusius, is highly commended. Stallions of other English or Scotch breeds: Mr. Groves (Yorkshire) gets the first prize, 100 thalers, with a very fine horse, "The Brewer;" and a clever three-year-old Clydesdale from the Royal Windsor farm gets the second prize, 50 thalers. "Dusty Miller," from Duffrieshire, is highly commended, and Mr. Forbes's four-year-old is commended. Mares of the above class: The first (100 thalers) and the second (50 thalers) prizes are taken by two good specimens of the Clydesdale bred from the Royal Windsor farm; a good-looking grey Yorkshire mare, the property of Mr. G. Warnecke, of Hamburg, being commended. The first, second, and third prizes (of 80, 40, and 30 thalers each), for the best pair of agricultural mares, were all taken by Mr. Crisp, for some useful mares, all three-year-olds. It was, in fact, a "walk over," as there was but one other entry, and that consisted of a pair of light carriage mares. There were several very active French horses and mares, the best being shown by Baron Nathusius, of the Percheron breed. Some good stallions and mares bred on the continent for agricultural purposes, but looking more fit for carriage-work, were shown; also some young geldings and fillies, but these latter classes were thought by the judges much too light for the purposes for which they were entered, and they withheld the prizes, several of them looking more

fit for hunting or light harness work. There were some clever ponies, the prizes being taken by foreigners, with the exception of a second prize of 15 thalers gained by Mr. Crisp for a five-year-old mare pony, with foal at foot. The arrangements in the horse department were very good, excellent boxes being provided, with canvas blinds to enclose them entirely at night. There was a horse-racing in which the horses paraded every day, and it was a novel sight to see six or seven pairs of carriage horses driven in breaks, &c., round the circle. Of these, a handsome pair of dark brown geldings, belonging to Mr. C. Oide, obtained the first prize of 300 thalers; and Mr. Holmes (Beverley) the second prize of 200 thalers. Too much cannot be said in praise of the pains taken by all the officials to have the meeting pass off well, and if only one or two of the classes had been more clearly defined we should not have had it in our power to say a word against the arrangements.

While our continental friends are happily exulting in their success, they have yet something to learn. On entering the yard we found the sheep exhibited from Great Britain almost studiously mixed up with the same breeds produced on the Continent; sheep in and out of their wool competing together, and the judges at work with the printed catalogue in their hands! The awards over, and the prize cards up, no one became the wiser, for they were placed at the highest part of the shedding, under the loose canvas which covered the sheds, and printed in small type. What would they have said in England? but this being in Germany, it mattered not to the English, who had not yet read up their German. At the lower end of the yard was the implement department, where we found the well-known stands of Shuttleworth and Co., the Howards, Ransomes, Barretts, Burgess and Key, Smith and Ashby, Barrett and Exall, Turner, Bentall, &c. There were 5 entries for steam ploughs, which were tried a short distance from the city. Trade was said to be brisk, especially in the locomotive department. We saw nothing on the ground that we had not seen before, and therefore reserved ourselves for the Worcester Royal. The mishaps amongst the steam ploughs, however, were numerous. One missed the boat at Hull; another received a severe "shaking" on the journey; a third toppled

over when at work on four-pace lands, and a fourth may probably pull through, and receive the reward of merit!

Summary of entries from Great Britain and Ireland: Horses, 67; cattle, 132; sheep, 400; pigs, 89; implements, 73; produce department, 4—total, 767. Total of entries from all countries: Horses, 524; cattle, 965; sheep, 1,766; pigs, 293—total, 3,548. Implements, 2,941; poultry, 323; produce, 786.—Grand total of all, 7,608.

Dogs.

Our note-book has thus far told its story out, but as a relief we take a walk over the open space between the yard and the "St. Pauli Gymnasium Jägerstrasse," wherein the first dog show of Germany was held. Here we find that the late Baron Ernst Von Merch was to have been the president, and that Mr. James H. Sillitoe is the recognized agent for Great Britain. The result has been tolerably favourable—not first-rate.

The sporting dogs embraced blood-hounds, fox-hounds, harriers, deer-hounds, greyhounds, pointers, setters, retrievers, spaniels, and badger-dogs. The 2nd division, dogs not used in field-sports—Mastiffs, Newfoundlands, bull-dogs, sheep-dogs, spits-dogs, terriers, pug-dogs, King Charles spaniels, toy terriers, Hungarian wolf-dogs, poodles, and Italian greyhounds. Amongst this goodly group we found say, 100 from England; and in the prizes we noticed Sir Watkin Wynn's couple of capital fox-hounds, and Mr. White's famous white and bull terriers. The English judges were Mr. Cawston, formerly master of the South Essex, and Mr. John Douglas, who had previously given them a helping hand. It was gratifying to see that the Englishmen had given great satisfaction to the Executive Committee; while we gathered an idea from the suggestive badges worn by the officials—these were silver brooches with a dog's head in the centre. Amongst the most remarkable foreign dogs were the Olgar mastiffs, a good specimen of the Russian wolf-hound—the same as shown by the Duchess of Manchester at the Agricultural Hall meeting. The large dogs were very remarkable, but small dogs not good. There seemed a want of attention to breeding, with feet and legs especially deficient. There was a large show of badger-hounds; and amongst the prizes offered was a deer-hound's head in silver.

FOREIGN AGRICULTURAL GOSSIP.

The current year bids fair to be known in France as one of the most precocious, and, at the same time, as one of the most complete in the development of the resources of the soil. With the exception of some complaints on the long continuance of drought, and the risk attached in consequence to the second crops of forage and roots, the meteorological aspects of what we shall soon have to style the past summer, have been particularly favourable; and the rare fact may be noted that there is at the same time a good crop of wheat, and a good crop of oats. At the district agricultural exhibition held at Rennes, the jury awarded a great gold medal to a steam-plough exhibited by M. Lots, Sen., of Nantes; and M. Jamet, a writer in the *Journal d'Agriculture Pratique*, having commented rather freely upon the merits—or rather what he considered the demerits—of the apparatus, M. Crussard, one of the jury at the show, and formerly director of the farm-school of Trécesson, in the Morbihan, has entered the lists in defence of the judgment delivered by his colleagues and himself, whom he affirms to be at least as competent to give an opinion on the subject as their critic. M. Crussard contends that if the principal merit of a plough consists in its turning earth well, the implement of M. Lots is entitled to high praise, as no apparatus could work better in this regard than his did. Moreover, hitherto the experiments practised in France in the matter of steam cultivation, have

been almost entirely carried on with implements of English manufacture, imported at a heavy expense and at a cost supported with great difficulty by cultivators. The steam-propelled pick-axe combination of Barrat Brothers is excluded from this remark; but it must be remembered that it belongs to an altogether different system. The jury at the Rennes show considered, then, that M. Lots, in coming forward, at considerable risk and expense, to dispute the foreign manufacture of steam ploughs in the French market, had a strong claim to an expression of public gratitude; as, if he has not completely solved the problem of steam cultivation in France, he has at least greatly advanced its settlement by proving the possibility of applying steam economically to the tillage of the soil, and exhibiting an implement which works as well as, if not better than, English ploughs of the same kind, while it is less fragile and less expensive. M. Jamet rejoins to M. Crussard that he heard a great number of persons, who witnessed the operation of the Lots plough at Rennes, blame the work performed by the implement. He contends, then, that he was simply the interpreter of public opinion when he declared that it executed tillage operations indifferently. The Government, he adds, might justly accord an indemnity to an unfortunate inventor who had incurred considerable expenses with a useful object; but he argues that the jury at Rennes failed to comprehend its duties when it allotted a

recompence of the first order to an implement which, working by means of a considerable traction, did 'less' than an ordinary plough drawn by two horses of average strength. "The spirit of nationality," continues M. Jamet, "must exercise no influence in agriculture. The tiller of the soil and the breeder of stock, who seek the best implements and the best animals, perform an act of patriotism even when they procure them from abroad, since they still enrich their country." Later experiments have been made, at the imperial farm at Vincennes, with the Lots plough; and M. Barral, who attended to witness them, adds his verdict, to the effect that the tillage executed was bad; but that, on the other hand, M. Crussard was perfectly right in defending the decision of the Rennes jury. Thus M. Barral saves the wounded *amour propre*, both of M. Crussard and M. Jamet; and he justifies himself in doing so on the three following grounds:—First, that M. Lots employs a portable agricultural engine, which appeared to him to be more simple and more appropriate for the purposes of French agriculture than the engines employed by English makers; secondly, that the traction apparatus is more simple than that of Mr. Fowler, although it is difficult to say, without comparative experiments, whether it is superior to it; thirdly, that, as at Vincennes, so at Rheims, the plough, properly so called, made only indifferent tillage, either not having sufficient penetration or not being heavy enough, while it had to work in a very hard soil; and, as M. Barral sensibly observes, the plough must change in steam tillage, as well as in tillage with horses or oxen, when the nature of the soil changes. The fault of M. Lots was in employing a plough which was not suited to the land in which it was placed; but, putting the plough on one side, M. Barral considers that the system of traction and the steam engine giving motion to the apparatus fully merited the reward allotted by the Rennes jury as well as by a former jury at Chartres. M. Barral suggests that the French Government should organize in a year or two a universal exhibition of implements for steam tillage purposes; that the meeting should be announced a year beforehand; that the trial grounds should be indicated in such a manner that exhibitors should know the nature of the soil in which they had to work; that the expenses, including those of transport, should be entirely sustained by the State; and that even pecuniary assistance might be fairly extended by the nation to inventors who, like Barrat Brothers, have made expensive and unfortunate experiments in the production of new implements.

Some modifications have been made in the regulations with reference to the awards of the "prizes of honour" at the district agricultural exhibitions of France. In future the commissions charged with the task of visiting farms competing for prizes of honour will alone have to pronounce their decisions on the merits of the competitors, and their awards will not be revised by persons who have not seen the localities. But M. Jamet contends that some further reforms should be attempted in connection with the commissions, and that two visits should be made in the year preceding the exhibition of prizes; the first in March, and the second in June or July. At the first visit it would be easy for the commissions to appreciate the tillage of the soil (which could be executed in their presence) in the double aspects of expense and mode of execution. A defective judgment may be formed of agricultural operations when a visit is paid later in the season, as the awkward or lazy farmer may conceal his shortcomings with a strong dose of guano. This is not all, as towards the months of June or July stock are generally in a healthy state, breeders having had time to bring them on in good pastures, or with abundant supplies of food. On a farm directed with intelligence, animals are fed equally well all through the year, and by making two inspections the commissioners would have ascertained that the prize of honour would not go to a breeder or grazer who treats his cattle ill through the winter, which is always a grave fault. The district agricultural exhibitions and prizes of honour can scarcely fail to do great things for France. At that held at Nevers, M. Dupin, procureur-general, argued that agriculture was the most abundant and assured source of national wealth and greatness, and contrasted the present position of England with that of France: "Led on by her maritime genius and her natural facilities for mercantile pursuits, England, our good neighbour," said the orator, "has given the

preference to manufactures and industrial enterprises. Her ambition has been to clothe the whole human race with her calicoes, and she has forced their production to an extraordinary point. But what has happened when cotton, which is not a product of her own soil, has failed her? She has seen a great part of her population a prey to a disastrous crisis and enormous sufferings. Among us the evil has been less, because agriculture has preserved its natural preponderance; and see the difference of the situations of the two classes of workers—agriculturists and industrials; agriculture requires more strong arms to execute its labours, while several manufacturers want work in order to occupy and feed their workmen!" We shall pass on to speak of the Nevers show in an early number. Meanwhile we may note that the entries of beasts were as follows:—

Breeds.	Males.	Females.	Total.
Charolaise	44	109	153
Parthenaise	10	10	20
Nantaise	2	4	6
Various French races	18	26	49
Durham	20	80	80
Various foreign races	7	19	26
Durham crossings	23	53	76
Various crossings	7	25	32
Total	126	286	412

The sheep classes filled thus:—

Breeds.	Males.	Females.	Total.
Merino and Mongrel Merinos..	37	45	82
Revrishonne	17	80	47
Solognote	8	18	23
Charmoise	19	25	44
Southdown	33	45	78
Various foreign breeds	8	15	23
Various French breeds	6	25	31
Various crossings	62	157	197

Total..... 190 .. 335 .. 525
English blood has, as usual, been at work!

BATH AND WEST OF ENGLAND SOCIETY.

The usual monthly Council Meeting of this Society was held on Saturday, July 4, at Donch's Railway Hotel, Taunton; present, J. Sillifant, Esq., V.P., in the chair, Sir T. P. Duckworth, Bart., Messrs T. Dyke Asland, D. Adair, R. Brent, M.D., C. Bush, R. H. Bush, R. Badcock, J. H. Cotterill, J. Daw, R. Dymond, J. T. Davy, T. Danger, J. Fry, M. Farrant, Dr. Gillett, John Gray, Jonathan Gray, J. Hooper, J. Hole, H. P. Jones, M. King, J. E. Keollys, J. Luah, G. Langton, Col. Lutterell, J. P. Pitts, S. Pitman, G. S. Poole, J. W. Sillifant, J. Widdicombe, H. St. John Maule (secretary), J. Goodwin (editor), &c. A letter was read from Earl Fortescue accepting the office of president for the current year.

The committee, stewards, and officers of the Society for the current year were nominated, with the understanding that their election at the August meeting would be dependent on a written expression of their willingness to act.

An offer by Mr. A. Simpson, of Birmingham, of a prize of ten or twenty guineas for the best calf fed upon food flavoured with his condiment from one week old, was respectfully but unanimously declined, several members protesting against the degradation to the prize list which a compliance with such an offer would involve.

Various important resolutions, having reference to the future conduct and management of the Society, were discussed, but a decision thereon was deferred until the next meeting, which will be in August.

The following new members were elected: Mr. Francis Buckland, Newton Abbott, Devon. Mr. Jeffery Michelmores, Berry, Totnes, Devon. Mr. Henry Clark, Edgcombe House, Totnes, Devon. Mr. J. Daw, Kennerleigh, Crediton, Devon. Mr. W. Daw, Kennerleigh, Crediton, Devon. Mr. J. B. Davey, Countess Weir, Exeter. Mr. E. N. Snow, Feniton Court, Honiton, Devon. Mr. F. P. Milford, Kenn, Exeter. Mr. Alfred Evans, Exeter. Mr. W. D. Brock, Crediton, Devon. Mr. P. F. D. Tucker.

The Council then adjourned.

CALENDAR OF AGRICULTURE.

This may be reckoned the general harvest month, as most kinds of grain crops will be cut and carried, except in high situations and northern latitudes. Wheat is best cut by hand-sickle and tied in sheaves. Barley and oats are mown, and may lie some days in the swathes before being tied into sheaves. When dried, carry the grains quickly. Turn over the bundles of peas very often, that no mouldiness may happen on the under-side. Store peas with little superincumbent pressure. Have plenty of thatch always ready.

In late climates the sheaves of grains must be made smaller in size, and may be very beneficially built into small ricks of three or four shocks in the fields, to stand there till dried sufficiently to be carried.

Cut all grain crops before dead ripeness happens: the straw makes better fodder, the sample of grain is brighter, and the meal is finer in the quality. The husks being thoroughly filled, the grain will soon become hardened.

Finish the clearing of all green crops, and earth-up potatoes with two furrows of the double mould-board plough, drawn by two horses, walking in distinct furrows, with a maintree of five feet stretching between them. A week may elapse between the furrows of earthing-up. Pull by hand any tall weeds that may afterwards arise.

Lay pulverized lime on clay fallows, harrow and plough it into the land lightly; or lay the cinders on the land and plough them under, when they will burst into powder by reason of the moisture in

the land, and the subsequent workings will mix the soil with the lime. This excellent method of laying on lime requires an earlier application in the last month. Lay dung on the wheat fallows, spread it, and plough under without delay; or drill the land with one furrow of the common plough, spread the dung in the hollows, reverse the ridge to with a single furrow, which will completely cover the dung. A cross harrowing will level the drills before the land is seed-furrowed.

Supply to horses and cattle in the feeding yards very ample stores of vetches, which will now have become very good provender from the pods being seeded; provide litter in abundance: the manure produced will repay almost any cost.

Fold sheep on bare spots of poor lands in pasture; go on with draining; turn over any earthy composts; burn peat and vegetable ashes as a manure, to be used in drill; keep the liquid tank filled with earthy substances; carry to the pit refuse matter of every kind.

Keep the draft ewes on good pasture, in order to get the animals fattened; put ewes to the ram for early lambs. The lambs of last spring must have good keep. Some farmers who have not winter food, nor the means of fattening, now sell the lambs and draft ewes.

Sow on beds of rich and well-prepared lands the seeds of drum-head cabbages, kohl rabi, savoys, and brocoli, for plants to be used in May. Sow about the end of the month rye and vetches for early spring use.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Sow the main crop of turnips in drills with an inch or two of good manure, and a pint of bone-dust to each barrow, three inches directly below the intended rows; and these drills ought to be struck in ridges, formed by taking a little of the earth from the spaces between them. Choose an open plot in land outside the garden, for turnips rarely prosper within it. Hoe and thin the plants as they grow, till at last they stand about nine inches apart, about two feet from row to row.

Cabbage for spring: Prefer to sow in the early part of the second week, but experience must guide in this respect. Some localities require them to be sown earlier, even in July.

Sow winter prickly spinach and endive in the second or third week.

Sow the hardier sorts of lettuce, carrots, and

onions for spring, and all the other vegetables omitted in July, excepting the legumes.

Cauliflowers to be planted under glasses or frames.

FRUIT DEPARTMENT.

Apples, pears, &c., or espaliers, are to have the spring or summer growth curtailed, except the leading shoots, in order to ensure the swelling of fruitful buds at their base.

Make fresh plantations of strawberries.

FLOWER GARDEN.

Attend to the routine directions so often given, and now re-pot and dress the auricula plants, and pot off seedlings. At the end of the month transplant or introduce evergreens, particularly if the weather be moist.

THE METEOROLOGY OF JULY.

The last three days of the month of June, which are included in our July period, were somewhat cool, the deficiency of mean temperature on those days amounting to about 4° daily. The sky was generally covered with cloud, and the atmosphere was very dry, the degree of humidity on the 29th and 30th being represented by 6.7 inches. Meanwhile the barometer was increasing, and it reached a maximum reading of 30.17 inches on the morning of the 1st of July, then decreased to 29.84 inches on the 2nd, and again increased to 30.12 inches by the 4th. During these four days, fine, bright weather generally prevailed, the highest temperatures in the shade ranging between 72° and 74° , and the thermometer exhibiting the extreme temperature in the full rays of the sun gave readings of 111° on the 1st, 104° on the 3rd, and 107° on the 4th. The mean temperatures, however, on these days were not very different from their average values, being on the 1st and 4th deficient to the amount of rather more than a degree, in excess to nearly 1° on the 3rd, and exhibiting no difference on the second day. From the 5th to the 8th fine, clear, bright weather prevailed, and the mean temperatures on those days exceeded their average values by the several amounts of $1\frac{1}{2}^{\circ}$, $2\frac{1}{4}^{\circ}$, $6\frac{1}{2}^{\circ}$, and $\frac{1}{2}^{\circ}$. From the 9th to the 15th, during which period the barometric pressure generally exceeded 30 inches, the fine, bright weather of the preceding days was still experienced, and the thermometer reached higher values than had been attained during the preceding portion of the year. Thus on the 9th 81° was reached, on the 10th $83\frac{1}{2}^{\circ}$, and on the 15th the still higher reading of 86° . The daily ranges of temperature were also extremely large on some days, amounting to $32\frac{1}{2}^{\circ}$ on the 10th, 12th, and 14th; and to 37° on the 15th. The mean daily temperatures all exceeded their average values by various amounts: about 5° on the 10th, 12th, and 15th; $4\frac{1}{2}^{\circ}$ on the 7th; $3\frac{1}{2}^{\circ}$ on the 11th, and by amounts less than 1° on the 13th and 14th. During this period also, owing to the generally unclouded state of the sky, very high readings were attained by a thermometer placed fully under the solar influence, which reached $124\frac{1}{2}^{\circ}$, 124° , 122° , 116° , and 115° respectively on the 12th, 10th, 9th, 15th, and 11th. The air was in very gentle motion throughout the whole of this period, and was also remarkably free from moisture, the degree of humidity on the 10th amounting only to 58 inches, on the 12th to 63 inches, 15th to 67 inches, and 9th and 13th to 68 inches.

Coincident with the fall of the barometer below 30 inches, which occurred on the 16th, was a great decrease in temperature, the means for several days commencing with the 16th, all falling below their respective averages to the amounts of $8\frac{1}{2}^{\circ}$ on the 18th, 6° on the 21st, about 5° on the 17th, 19th, 20th, and 24th, and to less amounts on other days, but never less than $2\frac{1}{2}^{\circ}$. On the 19th day the temperature fell as low as $38\frac{1}{2}^{\circ}$, and the thermometer on grass to $28\frac{1}{2}^{\circ}$.

Notwithstanding the change of wind on the 17th to the more humid quarter, the S.W., and the greater prevalence of cloud, the atmosphere remained almost as dry as before from the 16th to the 20th; but on the 21st the increased force of the wind, connected with a rapid barometric decline, induced an idea of approaching rain, and by noon rain commenced falling, and continued to fall heavily during the remainder of the day, the total fall amounting to 0.42 inch, and was followed on the next day by another fall to the amount of 0.33 inch, making a total fall for the two days of three-quarters of an inch. This rain was remarkable as having been the first of any importance since the thunderstorm of June 24th, a period of almost four weeks.

The 24th was fine, but cloudy; the 25th was somewhat damp, and rain fell to the amount of 0.13 inch, and the remaining two days of the month, namely, the 26th and 27th, were fine bright days throughout.

Examining the tables of results, we find that the highest barometer reading occurred on the 13th, and was 30.31 inches; the lowest was 29.32 inches on the 22nd, giving a range for the month of one inch. The highest temperature in the shade was 86.0° on the 15th, and the lowest 38.7° on the 19th, giving a range (within four days only) of 47.3° . The highest reading in the rays of the sun was 124.5° on the 12th, the lowest on the grass was 28.4° on the 19th. The dampest day in the month was the 21st, the driest was the 10th, and the difference in the degree of dampness of these days (considering a saturated atmosphere as 100 parts), amounted to no less than 40 parts. Rain fell on three days only throughout the month, and the amount collected was 0.88 inch, which, though large for three days' fall, was extremely small as compared with the average fall for the month, falling short of it by 1.8 inch.

The past month, therefore, has been chiefly remarkable for its fine, dry, and almost rainless character. The effect upon vegetation has been wonderful. Farmers in this part of the country availed themselves of the fine weather at the commencement of the month to get in their hay, which although short, owing to the weather in preceding months, was of good quality. Wheat has progressed rapidly towards ripening, and is now almost ready for the sickle.

METEOROLOGICAL ELEMENTS FOR THE NEIGHBOURHOOD OF LONDON;

FROM JUNE 28TH TO JULY 27TH, 1863.

Month and Day.	Temperature of the Air in Shade.			Highest Reading of a Thermometer in the full Rays of the Sun.	Temperature of Vegetation.*	Degree of Humidity. (Saturation=100).	Amount of Cloud, 0 to 10.	Amount of Rain. Inches.	General Direction of the Wind.	Weather Remarks.
	Highest.	Lowest.	Mean.							
1863.	°	°	°	°	°					
June 28	69.5	47.2	57.3	100.7	46.2	74	9.0	0.00	w., s.w.	Generally cloudy
29	72.0	48.0	57.4	110.0	46.3	67	5.5	0.00	w.s.w.	Variable, showers at night
30	69.2	46.7	56.9	103.8	46.7	67	6.0	0.00	w.s.w.	Partially cloudy
July 1	72.9	45.5	60.2	111.0	40.0	67	1.5	0.00	sw, sse.	Fine; few clouds
2	72.0	55.1	61.4	103.5	47.9	76	4.8	0.00	w.s.w.	Cloudy till night, then clear
3	74.2	52.6	62.2	96.6	49.7	67	9.0	0.00	n.w., n.	Generally cloudy
4	72.5	50.0	60.4	107.2	45.0	71	9.5	0.00	n.e.	Generally cloudy throughout
5	76.6	52.3	62.8	99.0	43.8	68	1.7	0.00	n.e.	Fine, few clouds, haze
6	77.6	52.5	64.1	117.0	44.6	73	0.0	0.00	s.e., s.w.	Cloudless
7	82.5	53.1	68.3	120.0	44.2	72	3.5	0.00	s.w., w.	Cloudless till night, cloudy
8	73.7	52.1	62.3	109.8	43.1	79	7.0	0.00	ws.w, nw	Generally cloudy
9	81.0	54.7	65.7	121.6	45.5	68	3.3	0.00	nne, se	Few light clouds
10	83.5	51.1	66.4	124.0	43.4	58	0.5	0.00	n.e., s.e.	Cloudless generally
11	79.8	51.2	65.3	115.0	42.3	70	5.8	0.00	n.e., s.e.	Light clouds prevailed
12	83.9	51.4	66.9	124.5	44.0	63	1.0	0.00	ne, ese.	Almost cloudless
13	75.0	56.0	62.6	107.0	53.2	68	10.0	0.00	n.e.	Generally cloudy
14	78.5	46.0	62.3	110.6	37.7	71	0.0	0.00	calm.	Cloudless, fine, hazy
15	86.0	48.9	66.8	116.3	39.6	67	0.5	0.00	calm, n.	Very hazy, cloudless
16	67.3	52.7	58.8	94.0	45.4	65	8.3	0.00	n.e., s.e.	Generally cloudy
17	73.8	42.5	56.5	109.7	40.0	73	6.5	0.00	s.w., n.w.	Partially cloudy
18	65.5	44.8	53.1	94.0	43.0	68	6.0	0.00	n.w.	Cloudy till nt., clear, rain
19	74.0	38.7	57.0	108.0	28.4	63	3.3	0.00	w., s.w.	Cldless till nt., overcast, haze
20	70.8	48.1	57.1	115.0	40.0	68	8.5	0.00	nw, calm	Generally cloudy.
21	64.6	46.6	55.6	70.3	36.2	98	10.0	0.42	s.w., s.	Overcast; heavy rain
22	67.5	54.3	58.0	94.2	48.5	86	10.0	0.33	sw., w.	Ditto, rain during morning
23	70.5	48.1	58.9	112.2	41.0	71	5.3	0.00	ws.w, nw	Partially cloudy, fine
24	67.7	44.1	56.1	95.0	33.6	76	5.5	0.00	w	Partially cloudy
25	67.8	51.1	58.1	93.8	44.7	87	10.0	0.13	w., n.w.	Overcast, frequent rain
26	69.7	46.0	55.1	99.8	37.0	74	6.7	0.00	n.n.e.	Fine day, cloudy mor., clr.nt.
27	75.0	45.8	59.0	100.0	37.2	78	2.3	0.00	calm.	Fine, few clouds

* The "temperature of vegetation" is that obtained from a self-registering thermometer placed on the grass at night. It is therefore a minimum reading for the previous twenty-four hours.

TABLE SHOWING THE PRINCIPAL FLUCTUATIONS IN THE ATMOSPHERIC WAVE, FROM JUNE 28TH TO JULY 27TH, 1863.

1863. Month, Day, and Hour.	Reading of Barometer.*		1863. Month, Day, and Hour.	Reading of Barometer.*	
	Highest.	Lowest.		Highest.	Lowest.
	Inches.	Inches.		Inches.	Inches.
June 28, 1 p.m. ..		29.78	July 16, noon	30.05	
July 1, 9 a.m. ..	30.17		" 18, 9 a.m. ..		29.61
" 2, 3 p.m. ..		29.84	" 19, noon	29.82	
" 5, 9 p.m. ..	30.16		" 20, 3 p.m. ..		29.61
" 7, 3 p.m. ..		29.87	" 21, 9 a.m. ..	29.64	
" 11, 9 a.m. ..	30.24		" 22, 9 a.m. ..		29.32
" 11, 9 p.m. ..		30.19	" 24, noon	29.97	
" 13, 9 a.m. ..	30.31		" 25, noon		29.77
" 15, 9 p.m. ..		29.97	" 27, 9 a.m. ..	30.06	

* All the readings are reduced to the constant temperature of 32 degs.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JULY.

The leading features of this month have been highly favourable to agriculture. The weather during the greater portion of it was unusually hot, the crops generally made rapid progress towards maturity, and harvest-work commenced in some districts nearly three weeks earlier than in the usual run of years. Apparently, the season has been peculiarly in favour of a large production of grain. With very few exceptions, the wheats are coming down remarkably well, and, in a general way, they promise the best yield almost ever known, both as to quantity and quality. From the circumstance that millers have held very limited stocks, attempts have been made to enhance the value of wheat. In some parts of the country they have been successful to the extent of from 1s. to 2s. per qr.; but, at Mark Lane, prices have shown a tendency to give way.

Buyers are waiting the arrival of the new crop, which, no doubt, will be somewhat eagerly purchased, at steady currencies. The best white wheats are likely to open at 55s. or 56s. per qr. All accounts agree in stating that the growth of barley is even larger and of finer quality than in 1882. One parcel has been on offer at Mark Lane in but middling condition at 38s. per qr. Oats are the heaviest crop ever grown in this country. About 50 quarters, weighing 42 lbs. per bushel, have been disposed of in London, at 28s. per qr. Beans are, perhaps, the poorest crop; nevertheless, it will come up to a fair average. Considering the great heat, and the want of moisture at one period, peas are likely to show a large result to the growers.

From these observations, it will be apparent that great abundance of food will be exhibited in our markets for some time. In some quarters it is assumed that prices will, consequently, rule much lower than they now are. We ourselves cannot admit that the quotations will be very low, because we must take into the account the greatly diminished stocks of foreign produce in warehouse, compared with the corresponding period last year, the great falling off in the arrivals from most quarters, and the moderate quantities on passage from the great producing countries. We here, of course, refer more particularly to wheat and flour, since we find that most other kinds of produce have reached us in fair average quantities since the 1st of January.

A great difference of opinion prevails in reference to the quantity of wheat now in stock in this country. From all the information we can gather, it appears to be quite equal to last season, although in some counties it is nearly exhausted.

The whole of the hay crop in the forward counties has been secured in very fine condition. The produce, taking the whole country, is about one-fourth short of last year. Its remarkably good quality, however, will fully compensate the farmers for this deficiency in the growth. In the metropolitan markets old meadow hay has sold at from £3 to £4, old ditto £3 10s. to £4 12s., old clover £5 to £6, new ditto £3 10s. to £5, and straw £1 8s. to £1 16s. per load.

The potato crop is turning out remarkably well; its produce is enormous, and there are scarcely any signs of disease to be met with. A large growth of potatoes will, no doubt, have some influence upon the value of the better kinds of food.

Considering that only a moderate quantity of rain has fallen, the turnip crop is promising, even upon moderately farmed lands. The crop of seeds is a full average one.

The public sales of Colonial wool, at which about 104,000 bales will be offered, have gone on steadily. Both for home use and export the demand has been tolerably active, and prices have been well supported. The sale of 1,000 bales of English wool passed off steadily at rates equal to the pri-

vate contract market. In the provinces, as well as in Ireland and Scotland, the trade has continued in a healthy state. Considering the activity in the demand for woollen goods, the stocks of wool held by the manufacturers are very moderate. Prices, therefore, appear to have seen their lowest range.

The hop bine has continued to progress steadily. In Worcester, however, the growth of hops will, it is apprehended, turn out deficient; but in Sussex and Kent it will somewhat exceed last season. The imports of foreign hops have been liberal, and they have been mostly disposed of at low prices.

Harvest work has become general in the South of France, and the crop of wheat is turning out extremely good. Barley and most other articles promise a large return. Apparently, the yield of wheat and maize in America is a very extensive one. The supplies which have found their way to the Lake ports have been mostly in a foul state, arising, it is presumed, from the scarcity of labour and the high wages now demanded.

In Scotland the crops are decidedly forward, and for the most part they promise a heavy yield, especially barley and oats. Cutting, however, cannot be commenced for some time. The demand for produce has been tolerably firm, and prices have continued steady. Potatoes are represented as likely to be fully equal to last year, both as to quality and condition.

The Irish markets have been fairly supplied with wheat, in which very little business has been doing at about previous quotations. Barley, oats, and most other articles have moved off slowly, nevertheless prices have been supported. The crops, especially in the northern counties, are looking remarkably well.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The Metropolitan, as well as the leading provincial markets, have been well supplied with beasts, in excellent condition. The demand for them, however, has been tolerably active, and the quotations have been well supported. Most breeds of sheep have come freely to hand, and, with very few exceptions, their quality has been superior to last season. The mutton trade has continued firm, at steady currencies. Lambs have commanded a free sale, at full prices. Calves and pigs, however, have moved off heavily, and the rates have had a drooping tendency. The northern "season" for beasts has commenced extremely well, the arrivals hitherto having been remarkably good. We understand that very few cases of disease have presented themselves amongst either beasts or sheep, compared with some former seasons.

The stock is doing well in the pastures; but the quantity of grass is by no means abundant. A great deal of old hay still remains in the country.

The total supplies of stock exhibited in the great Metropolitan Market have been as under:—

					HEAD.
Beasts..	..	..	..	..	24,070
Cows ..	..	..	..	..	525
Sheep and Lambs	..	..	..	..	169,870
Calves ..	..	..	..	..	3,822
Pigs ..	..	..	..	..	2,682

COMPARISON OF SUPPLIES.

July.	Beasts.	Cows.	Sheep & Lambs.	Calves.	Pigs.
1882	22,392	508	151,060	2,339	2,637
1881	19,740	560	156,140	2,532	3,240
1880	19,870	490	153,600	3,133	2,428
1889	19,800	476	166,632	3,609	2,430
1888	20,468	547	154,922	4,262	3,290
1887	19,556	530	142,280	3,830	2,395
1886	18,389	500	135,650	3,407	3,235
1885	16,702	535	149,470	2,747	4,000

The annexed statement shows the imports of foreign stock into London during the month:—

				HEAD.
Beasts	..	..	..	6,223
Sheep	..	..	..	32,090
Lambs	..	..	..	6,193
Calves	..	..	..	4,095
Pigs	..	..	..	2,951
Total	..	..	..	51,552
Same time in 1862	..	..	..	38,272
" 1861	..	..	..	37,262
" 1860	..	..	..	44,658
" 1859	..	..	..	30,847
" 1858	..	..	..	31,192
" 1857	..	..	..	26,968
" 1856	..	..	..	30,537
" 1855	..	..	..	22,642
" 1854	..	..	..	22,242
" 1853	..	..	..	38,795

Our continental letters state that about average supplies of beasts and sheep are in process of fattening for export purposes. It is not anticipated, however, that the shipments will exhibit any material increase.

The comparison of the arrivals of home-fed, as well as Irish and Scotch stock during the month stands thus:—

	July, 1862.	July, 1863.
From Northern Counties	7,700	12,450
Norfolk, &c.	2,700	700
Other parts	5,800	4,700
Scotland	1,000	806
Ireland	890	470

It will be seen that Lincolnshire, Leicestershire, and Northamptonshire have forwarded a large number of beasts this season; but that the receipts from Ireland and Scotland have been on a very moderate scale.

COMPARISON OF PRICES.

	July, 1863.	July, 1862.	July, 1861.
	s. d.	s. d.	s. d.
Beef from 3 4 to 5 0 .. 3 0 to 4 10 .. 3 4 to 5 2			
Mutton..... 3 8 to 5 0 .. 3 6 to 5 2 .. 3 4 to 5 4			
Lamb 5 4 to 6 4 .. 4 5 0 to 6 4 .. 4 5 0 to 6 4			
Veal 3 8 to 4 8 .. 4 0 to 5 0 .. 3 8 to 4 8			
Pork 3 6 to 4 6 .. 3 10 to 4 10 .. 4 0 to 4 10			

Newgate and Lendenhall have been fairly supplied with each kind of meat, and the trade, generally, has ruled inactive. Beef has sold at from 3s. 2d. to 4s. 4d., mutton 3s. 4d. to 4s. 6d., lamb 5s. to 5s. 10d., veal 3s. 10d. to 4s. 4d., and pork 3s. 4d. to 4s. 6d. per 8lbs. by the carcass.

DERBYSHIRE.

It seems as if we were to have what those weather prophets foretold, a dry and hot summer. We still have not much faith in what they profess to understand; but believe the government of all material things are on the shoulders of Him who directeth all things according to the counsel of his own will. However, at present we are passing through one of the phases of a hot season, and our pastures need rain. In many localities grass is getting scarce and much burned up. The hay harvest is near its close, and the crop has been gathered in fine condition; the great bulk without rain. It has fallen light; but the quantity of old hay on hand (nearly half a winter's consumption), added to the new crop, leaves us amply provided for. The price still remains low. The corn crops, with a few exceptions, are splendid. Wheats have flowered and set as well as we could wish; the crop is bulky enough and the straw strong. We anticipate more than an average return; it may be premature to say how much. The oat crop, where early sown (and the great bulk was sown early), is very good, and promises to be very fine in quality. Barleys will be fine enough in many of our cold and late localities for malting, and the maltsters will have choice enough where they have been shy buyers. This county has always a few select lots in the southern parts; but this year we shall have, as far as we can now judge, good everywhere. The pea crop (always the gentleman, as the farmer's adage is) is very good, and the yield will be great. But few beans are

grown; but the few are as good as we can desire. And thus, as far as we can now judge, there is every prospect of "The Glorious Harvest of 1863." The turnip plants want rain, and will, without some alteration we cannot now see, be a light crop. Mangel wurzel, where got in early, is favourably spoken of. The potato crop must be good. Those of the early varieties already gathered are excellent in quality and please the epicure. Most of the wool has changed hands at very remunerative prices. We think those who have kept back their clip, expecting more, unwise. Our fat stock markets are but sparingly supplied, and prices keep up. The value of store stock is influenced by the coming scarcity of keep, and for such the summer may be an unprofitable season. Our corn markets are dull ones, with but little variation as regards value. The holders seem determined to wait to see if some unfavourable aspect come over the trade; but to the present they have been disappointed, and thunder and lightning, and storm, and tempest have been graciously withheld. We blame them not; some one must hold on, and those who do this season will hold to lose. The quality of last year's crop cannot be brought with advantage into competition with the fineness promised us in the coming harvest. The demand for labour has been moderate of late, and the beautiful weather has favoured the farmer in the getting of his hay. Very little effort was needed, beyond the cutting and tedding; and to many a poor man's family it has been a spare season. We, however, have not many out of employment, and the corn harvest just at hand will take up the small surplus.—July 20.

ISLE OF ELY.

This is certainly one of the strangest seasons we have ever known: we ransack memory in vain, in our efforts to discover its like—a winter without frost, and a spring without rain; although severely cold, and a summer characterized by drought and great heat, with a sudden change to cold, and even to frost. For many days the thermometer ranged between 80° and 82° in the shade, and the weather was brilliant, and continuously without rain. A few days ago there was a sudden change to cold again; and yesterday morning (July 19th) there was a severe frost, to which the potatoes on the light soils testify, for to-day we observe they are quite black, and appear cut as badly as they were in May. What effect this rapid fall in temperature will have upon the wheats on the same soils we cannot tell; whether they were too far advanced towards maturity to be seriously injured, or whether the kernel will cease to develop itself, and shrivel up and produce an inferior sample, the future must determine: we shall anxiously await its revelations. Up to this time wheats have presented a healthy and promising appearance; there is less disposition to blight and mildew than we frequently witness. The crop of straw is not bulky, but is thick enough upon the ground for a good average crop. Next week some of the earliest fields will be fit to cut, but harvest can scarcely be general before the following week. Peas and Poland oats on gravelly soils are getting ready for the sickle, and a few fields are already being cut. The oat crop on these soils is not heavy, say two qrs. per acre less than last year: on the cooler lands there is more bulk. Mangolds are growing fairly on moist soils, but can make but little progress on others. Grass keeping is scarce, and pastures are bare and withered; we never saw them worse. The shortness of keeping makes lean stock a slower trade, and prices are gradually declining. The corn trade is languid in the extreme; buyers await the new crop ere they operate freely.—July 20.

YOUR PEN REPORTER.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BRENTWOOD FAIR.—There was a large show of horses, including some very useful cart horses and nags. There were but few cattle and sheep, and business in all departments dull.

BRISTOL GREAT COLT FAIR.—The business was slow and unsatisfactory. The supply of cart colts was very good as to number, and these included as good specimens as have

ever been shown in the market. The colt which perhaps attracted the most attention, and was indeed considered by many to be the best in the market, was sold for £30. It was a fine handsome cart colt, two years old, and was bred by Mr. Davis, who owns the sire as well as the dam; indeed, there were about twenty colts in the market by the same sire, and they were among the best there. Mr. Hardwick, of Portbury, had a couple of them, a brace of handsome, big, useful gray colts, for which he asked £70, but did not obtain a purchaser for them. There were a great many seasoned cart horses, for which there was only a poor sale, the entire business being done between dealers. There were some smart Irish three-year-old nags, which promised to make good horses, but there was a great difficulty in getting them off. The same might be said of other nags.

CAMELFORD FAIR was very thinly attended. Only about 2,000 were exhibited, which is 3,000 less than was exhibited in the previous year, almost every one of which was sold at very high prices, many making as much as 9d. per lb. Such a brisk lamb fair has not been known in this town for several years. A very great improvement has been made in the flocks of this neighbourhood of late. Lambs, which a few years since were sold for 5s. per head, were last Friday sold for 15s. a head. The cattle fair was not so brisk as the lamb fair. The early part of the day it was very dull. Sellers were asking too much money, but at the close it was found that about 270 had changed hands at high prices.

CHIDDINGLY FAIR.—The number of sheep and lambs penned fell about 2,000 short of those exhibited for sale last year. There being a wide difference in the quality of the lambs shown, the prices ranged from 18s. to as high as 28s.; wethers might be obtained at from 36s. to 41s., and ewes from 31s. to 37s. Beasts formed rather a more important feature at this fair than they have usually done before, these being from 250 to 300 head on the ground, most runts and shorthorns. The former class varied exceedingly, some being sold at as low a figure as £6 10s., while £13 15s. was made for others of fine quality; the shorthorns ranged between £6 and £10, and business was pretty lively in these descriptions of stock. There were a great number of horses for sale, more, it is understood, than have ever been seen here before, and consequently they might be had at low figures. Serviceable nags could be obtained for £12 and £15, while a first-rate animal might be secured for £25. Heavy draught horses were sold at from £12 to £30, the latter being only given for the top quality. Neat ponies brought from £5 to £8. Horses, from the large supply, hung on hand.

COLCHESTER FAIR.—The show of horses was far more extensive than usual, and included some very superior animals; but of stock there was scarcely an average. A brisk trade was done in the better class of animals, and prices were about the same as at St. John's Green Fair.

EARL SOHAM FAIR.—Mr. Tye, Dallinghoo, 800 lambs, the best in the fair, made 31s. a head; Mr. N. Cmesy, 600 sheep and lambs; Mr. Job Wicks, 300 lambs; Mr. I. Moseley, Glenham, 160 lambs; Mr. Wolton, Framlingham, 120 fat sheep, which made 49s. each; Mr. G. King, 200; Mr. Rush, 150 lambs; Mr. Newson, Framlingham, 300 sheep and lambs; Mr. Gooderham, 100 fat sheep; Mr. Birch, Otley, 100 lambs; Mr. Barber, 100; Mr. Redgrave, 50; Mr. Worpel, 80 fat sheep, which made 50s. each. With odd lots the show numbered about 7,000. There were also 100 beasts, and a good supply of horses. Mr. Fenner showed a number of fine colts, which realised from £10 to £18.

FORT-WILLIAM MARKET.—As regards prices, lambs were much in demand, and they fetched from 6d. to 1s. 6d. above last year. Wethers and ewes were not so freely disposed of, but some of the best lots changed hands at rates similar to those obtained at Inverness. Wool had an upward tendency. Blackfaced clips, not superior, we understand to some that were disposed of at Inverness, fetched 6d. more at this market, and the average prices were higher.

GLOUCESTER MONTHLY MARKET.—There was a moderate supply of beasts; trade was steady, and late currencies were supported. The supply of sheep was short, and obtained last market's quotations. Lambs were scarce, and sold readily, with an early clearance. Beef realised from 6½d. to 7½d., mutton 7d. to 7½d., lamb 8½d. to 9d. per lb.

HORSHAM FAIR.—There were not so many sheep and lambs as there were last year, by about two thousand. The

number penned was 9,789. Horses and horned cattle were brought in great numbers. The highest price we heard of being made for lambs was 38s., and these we were told belonged to a Mr. King, near Petworth. Mr. Bird, of Sutton, sold a flock at 81s. 6d. These were very fine lambs. Upon the whole they were considered rather dearer than last year. Business generally rather dull.

HELSTON FAIR was well attended. The cattle fair was not largely supplied with beasts of any description. The few fat ones readily realised 63s. to 66s. per cwt.

HONITON FAIR.—The supply of cattle was not nearly so large as before. About 340 bullocks were driven in and sold readily. Steers from £6 to £12; oxen, £15 to £18; cows with calves, £12 to £16; two year-old heifers, £7 to £9. There were only about 1,380 sheep penned. Sales were quick, and the prices realised were—wether sheep, from 34s. to 38s.; store ewes about 36s.; lambs, 20s. to 26s.; rams £4 to £7 each.

INVERARY FAIR.—The sale of lambs was very brisk, especially for the best top of ewe lambs for stock. These were from 30s. to 40s. per clad score above last year. Top wedder lambs also met with a ready sale, at slightly above last year's prices. Blackfaced wethers were also largely in demand, and sold easily at about 20s. per clad score in advance of last year, though several lots brought only last year's prices. Two-year-old blackfaced wethers were from £20 to £24 per clad score, and three-year-olds from £25 to £28 10s. Drift blackfaced ewes brought from £13 to £16 10s. per clad score, and were about 1s. per head above last year. Blackfaced top lambs brought as high as £10 10s., and several lots ranged between £9 to £10; secondas brought from £8 10s. to £8, and shots from £5 to £6; Cheviot tops brought from £10 to £14, and secondas from £6 to £9 per clad score.

OBAN SHEEP MARKET.—There was an extensive and very active business done in sheep and lambs in the early part of the day. The stocks are usually in good condition this year. On last year's prices there was a slight advance. For shot ewe lambs there was a keen demand, and prices were from 1s. 6d. to 2s. above last year. Wedder lambs were from 6d. to 1s. per head above last year. The demand for draught ewes was also excellent, and the most of the stocks offered were sold at an advance of about 1s. per head. Wethers, especially two-year-old, brought in most cases also an advance of about 1s. per head.

READING FAIR.—Dairying stock, large, well-bred cows in full profit £18 to £22, small ditto £14 to £16, cows and heifers to calve down £10 to £13, store steers and stock heifers £9 to £14, and beast in fat condition £17 to £23; grass-fatted cows and heifers £13 to £17, well-bred bulls £13 to £18. Nearly the whole of the stock was sold. The horse fair comprised a very large show of mixed descriptions of horses. The following were the selling figures: Well-bred young horses, fit for private carriages, phaetons, &c., 55 to 65 guineas; and thick-set, well-made horses for public vehicles and hackney work, 25 to 32 guineas, and ditto suitable for carriers' work, van work, and town purposes, 28 to 40 guineas; heavy cart horses, for road work, &c., 45 to 50 guineas; and ditto for farming purposes, 16 to 25 guineas; well-bred horses suitable for saddle, road, and field, made from 40 to 65 guineas; handsome cobs, 16 to 23 guineas; and neat harness ponies 12 to 16 guineas; cart colts of promise realised from 24 to 30 guineas, and nag colts of good pedigree fetched from 30 to 40 guineas.—*Observer.*

ROCHE FAIR.—There was a dull sale. Fat cattle scarce, and large demand for lambs, but the supply was very scarce.

SALISBURY FORTNIGHTLY MARKET.—Secondary and inferior sorts met with a slow sale, and some remained in the market undisposed of until late in the afternoon. Best qualities moved off rather more easily, and prices were the turn against buyers. Sheep were also in good supply, and realised fully late rates. Only a few pens of lambs were offered, and a fair clearance was effected. Oxen 11s. 6d. to 12s. 6d., and heifers 10s. to 11s. 6d. per score. Best Downs may be quoted at from 7d. to 7½d. per lb., and mutton of inferior quality 6d.

SANGUHAN FAIR.—For sheep there was a fair demand, and a good number of lots were sold. Prices had an upward tendency, and an advance was made upon the current rates of last market of from 1s. to 1s. 6d. per head, according to the quality of the animals sold. Blackfaced ewe lambs sold a

from 14s. to 21s., and Cheviot ewe and wether do. at from 9s. to 13s. Blackfaced ewes, again, sold at 24s. 6d. upwards, and Cheviot do. from 26s. upwards.

SHERBORNE FAIR was but poorly supplied and thinly attended. In the cattle fair there was great unwillingness to purchase, and beasts were a drug, none but the primest realizing from a shade under 11s. to 12s. Lambs sold better, and fetched from 21s. to 27s., mutton 6½d. to 7d. per lb. The wool buyers were in pretty good force, but were not willing purchasers at the present high rates, 1s. 9d. per lb.

ST. BOSWELL'S FAIR.—The number of lambs was a little short of those exhibited last year, but the appearance and condition of the lambs were immeasurably superior. As on former occasions, the attendance of business men was large, there being many farmers and dealers from distant parts of the country. After the arrival of the special train from Edinburgh (which brought a large number of dealers to the fair), sales commenced, and it was soon observed that the better sorts of lambs sold well. Prices were from 2s. to 4s. above last year's quotations, a rise occasioned, no doubt, by the better condition of the animals, and the high price of wool.

ST. COLUMB MONTHLY MARKET.—There was a small supply of fat bullocks and sheep, as also of purchasers, which no doubt was accounted for in consequence of the bad state of the weather, it having rained in torrents all the morning. Fat bullocks fetched from £3 3s. to £3 5s. per cwt., and fat sheep from 6½d. to 7d. per lb. Of other cattle there was a very small supply.

TYNDRUM MARKET.—Blackfaced ewe lambs were bringing high prices, and there was a very eager demand for them, they being required to replenish stocks. For these sorts the advance was from 1s. to 2s. per head. Wether lambs brought also an advance on last year of about 1s. per head. Draught ewes were also very largely in demand, and sold readily at an advance of from 20s. to 30s. per clad score.

WEDMORE FAIR.—Beef of the "cowey sort," *alias* "old songsters," ruled from 8s. 3d. to 8s. 6d.; ditto, of a superior character, heifer and ox description, from 10s. to 10s. 9d. per score. Ewe mutton realised 6d. to 6½d., wether ditto, not over heavy, 6d. to 6½d. per lb., the top figure. Store pigs changed hands sluggishly, at lower rates.

IRISH FAIRS.—**NAYAN:** Beef maintained full prices and reached 3 guineas per cwt. Second class beef averaged 55s. per cwt. The store department was well attended by purchasers, and the sales were on a brisk scale. The highest price obtained for heifers was £14 per head. The general average prices for three year olds was £11 to £13 each; two year olds from £8 to £10, and yearlings, which were rapidly bought, from £1 to £2 10s. each. The supply of springers was not large, in general the quotation was from £12 to £20 each. Withers ranged from 47s. 6d. to 51s., hoggets from 44s. to 46s., and lambs from 27s. to 30s., and up to 32s. for the best in the fair; inferior lambs from 18s. to 23s. each. Small pigs improved in price, and fetched for weanlings and suckers from 26s. to 36s. per pair; slips sold readily from 20s. 35s. each, and a few good stores reached 50s. each. There was a large show of horses. A few of the best in the fair reached £60 to £70 each; harness horses brought from £20 to £25 each; farmer's nags sold from £12 to £14 each. **LISBURN:** The horse fair was well supplied, and there were some that brought long prices. Several dealers from the other side of the channel were present, and were able to obtain some first class horses. The supply of black cattle was large, and prices varied from 45s. to 60s. per cwt. Mutton, which was in good demand, brought 6d. to 7d. per lb., sinking off, and lamb 7d. per lb.

CARMARTHEN BUTTER EXCHANGE, (Saturday last.)—An average supply of butter at market to-day, for which there was a lively demand, and prices fully sustained, the fine qualities realising 82s. to 84s., and inferior 74s. to 80s. per cwt. The weather having become cooler, the butter is in better condition.

CORK BUTTER EXCHANGE, (Saturday last.)—The supplies this week were heavy, especially at the close. Demand good, but prices had a declining tendency. Firsts, seconds, and thirds fell 1s. each in the early part of the week; but firsts and thirds recovered yesterday, the latter being firm at 71s. The supply of mild cured was a little over 200 daily; to-day it quotes 90s., 86s., and 74s., for firsts, seconds, and thirds.

GLASGOW, (Wednesday last.)—The supply of cheese from the south continues good, and the demand fair, fully twenty tons having passed the weigh-house scales, about last week's prices. Old Dunlop 60s. to 64s., new ditto 48s. to 53s., Cheddar-made new 54s. to 58s. 6d.; Skim milk 31s. to 23s. per cwt.

GLOUCESTER CHEESE FAIR was largely supplied and well attended. Trade was good, at lately prevailing rates.

HOP MARKET.

BOROUGH, MONDAY, July 27.—The business of our market is limited to a small consumptive demand, which, however, with the few good Hops on offer, is sufficient to keep prices firm. The reports from the various districts of the plantation are of a more favourable character. Currency as before.—**MASS & WILD.**

WORCESTER, (Saturday last.)—The hops are doing pretty well, considering the cold nights we have had the last week. On the market there is nothing doing.

MAIDSTONE, July 23.—The hops in many parts of our plantations are looking better than when we last wrote. The rains have certainly improved their condition, although it is the opinion of many that the mould will spread. All would now seem to depend upon the weather. Some grounds still look very sickly, the bine turning black. There is still honeydew and vermin, although the latter may be said to have decreased. The plant is very forward for the time of year, and this is in its favour. We hope for warm nights and sunny days. Reports have reached us from **AYLESFORD:** The rains of Tuesday and Wednesday appear thus far to have done us some good, but whether or not the benefit will be permanent remains to be seen. The bine is certainly cleaner, but there is still plenty of vermin with honeydew. **ALLINGTON:** We can show a good bine in some of our grounds, while in others there is a slackness, and the plant looks unhealthy. The recent rains may eventually prove beneficial to the growth. **ADDINGTON:** A strong bine at places, and plenty of it. In some grounds an increase of vermin and mould. **BOXLEY:** We are certainly looking somewhat better. In many grounds the bine has increased in strength, while the condition of the plant has improved. There is more vermin than we like, but mould does not as yet increase to any extent. **BARNING:** Our appearances are still good; we have a strong and healthy bine, with very little, thus far, to injure it. **BOUGHTON MONCHELSA:** Our hop grounds are looking well. The bine is strong, and in good condition. In common with our neighbours, we have vermin, and a little honeydew. **DIRTON:** We notice a slight improvement in our hop grounds. The bine grows fast, and is not so closely followed up by the vermin. We must, however, have very genial weather if we grow anything like a good crop. **EAST and WEST MALLING:** The rains have done us good. The bine, which in places was completely invested with vermin, is somewhat cleaner, and should the weather be favourable, we shall grow a crop, although at one time appearances were much against us.—*Sussex Express.*

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, July 27.—The supplies of Potatoes at these markets are by no means extensive. For all qualities there is a steady demand, and previous quotations are well supported. There were no imports into London last week.

Kent and Essex Regents . . . per ton 90s. to 120s.

Shaws 90s. to 100s.

COUNTRY POTATO MARKETS.—**DONCASTER (Saturday last):** A very good supply of Potatoes, for which the inquiry was moderate. Prices ruled lower than those paid last week, viz., 8s. 6d. per hamper of five pecks for round potatoes, and kidneys 4s.—**MALTON, (Saturday last):** The potato supply was good, but, as a rule, the yield is small in size; prices from 1s. to 1s. 4d. per peck retail, 10d. to 1s. wholesale.—**MANCHESTER (Saturday last):** New potatoes 9s. to 13s. per 252 lbs.—**YORK (Saturday last):** The market was well supplied with excellent potatoes, which have not received too much rain. Round ones sold at 9d. per score of 21 lbs., and 10d. to 11d. per peck retail; kidneys 11d. per score, and 1s. per peck retail.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

July, on the whole, was a very brilliant month, but, in keeping with the extraordinary character of the seasons this year, has exhibited every variety of temperature. For the first fortnight, the heat had acquired a tropical intensity; then came cold, which reached below the freezing-point on the mornings of the 18th and 19th, doing some damage to the late crops; and this was presently followed by heavy rains, which lasted for two days, but the last few days were again fine. New wheat had been expected at the London market before the month was out, but it only appeared in small samples, which were promising as first-fruits for the bulk. The rain had, in fact, retarded the commencement of reaping with many, but this was not expected to be general till the beginning of August. By all accounts, a full average of fine quality was expected. The new barley brought to market was not so promising, being small and steely, and some of various colours; but doubtless there are localities which will send finer. The oats appearing have been very good, but yield not expected to be abundant. Peas very fair, and moderately plentiful. The standing crop of beans is but indifferently reported as a whole, the rains in June having forced up the straw, and the black-fly being plentiful. Foreign countries have been going on favourably as respects their corn produce. The rye in considerable quantities has been gathered of good quality, and in fine condition, in France, Belgium, and Germany. Wheat in the south of France and other southern countries, with the exception of Hungary, turns out a fair average; but in the last-named country, the drought has not only lessened the corn materially, but swept off vast quantities of cattle, and brought severe distress on the agricultural population. America, but for the terrific strife still ruling, which has materially affected labour, promises well, not excepting the British possessions in Canada. With foreign imports much reduced, the fine weather this month has very little affected prices; but the Polish difficulty gathering strength with time may seriously diminish foreign importations next season, and must do so if a war with Russia breaks out. Let us hope, however, that the fearful effusion of human blood now witnessed in the old world and the new will be stayed by the power of Him who gives the fruitful seasons, not for the renewal of conflicts, but that all may eat and be satisfied, while they acknowledge his goodness and providential care.

The following prices quoted from recent advices partly account for the late small foreign arrivals as compared with previous imports: Wheat at Paris of good quality 50s. to 52s., some new being sold at 50s. 9d. per qr.; red winter American at Antwerp, 50s.; native quality at Courtrai, 53s.; high-mixed Polish at Amsterdam, 56s.; red American, 51s. 6d.; Wahren red wheat at Hambro', 50s.; native

at Cologne 50s., foreign 46s. 6d. per qr. After a heavy decline at Dantzic, in consequence of serious failures, high-mixed partly recovered, and was last quoted 51s. per qr. At Straubing in Bavaria the top price was 49s. 6d. per qr. Wheat at Galatz was quoted 31s., at Ibraila 32s. 6d.; Saidi at Alexandria 29s. 6d., Banat wheat at Trieste 42s., soft wheat at Algiers 46s. Montreal advices quote spring Canada wheat 31s. 7d., red winter 34s. 6d., white winter 35s. 2d. per qr., all per qr. of 480lbs. Chicago spring at New York 29s. 6d., amber Western 34s., red winter 33s., Milwaukee Club 31s. 6d. per qr.

The first Monday in London commenced on small English and good foreign supplies of wheat. Very few fresh samples appeared during the morning from Kent and Essex, and with a week's finest possible weather business was extremely slack, and prices barely maintained. In foreign scarcely anything was passing, excepting in retail, though holders in many cases would have gladly accepted a decline of 1s. per qr. to make sales freely 'ex ship. Though arrivals off the coast were scanty, the sales made were at 1s. per quarter reduction on the prices of the previous Monday. Many farmers being busy with hay-making, and few having much to send, the markets in the country were but poorly supplied. Yet several of them were influenced by the fineness of the weather, and a reduction of 1s. per qr. was very generally submitted to, as at Leeds, Hull, Lynn, Boston, Spalding, Bury St. Edmunds, Gainsborough, Newark, Newmarket, Malton, Oakham, and many other towns, Rochester noting a decline of 1s. to 2s. per qr. Liverpool was 3d. per cental down on Tuesday, with a still downward tendency at the week's close. Edinburgh and Glasgow were also 1s. per qr. cheaper, and Dublin was very dull, though nominally prices were the same.

The English returns on the second Monday were small, and the foreign supply less than half reported on the previous Monday. There was again a very small show of samples during the morning from the near counties; but, with a continuance of the finest weather, sales were more difficult, even for the best parcels, while inferior were sold at less money. The same heaviness prevailed in the foreign trade, buyers being strictly on the reserve, and limiting their purchases to the necessity of the day, though had they been minded to operate freely, they might have done so on more easy terms. Only a few floating cargoes were offering, but it was difficult to place them on previous terms. With harvest commencing in the country, very little this week was sent to the several markets, and buyers were equally scarce; so that a general dullness prevailed, though not with an equally decided decline, which at the most was only 1s., and in but few places accepted, as at Birmingham, Stockton,

Malton, and Gainsborough. Liverpool, though 2d. per cental cheaper, on Tuesday partly recovered the decline on the following Friday's market. In Scotland and Ireland there was great dullness in the wheat trade, though no decided reduction was noted.

The third Monday had a still smaller supply of wheat, both of home growth and from foreign parts. The morning's show from Essex and Kent made a very small increase to the few samples of English left over, inasmuch that, though the weather had continued favourable, there was much more readiness on the part of millers to clear what was offered, though no more money was paid. More confidence generally prevailed on the part of foreign holders, but the large failures at Danzig made these qualities more easy to purchase. Floating cargoes went off better, at fully the previous rates. The improved tone of the London market, and a heavy fall of rain subsequently, made several of the country markets dearer this week; but the advance did not exceed 1s., as noted at Boston, Newbury, Stockton, Barnsley, York, Leicester, Northampton, Nottingham, and Sunderland, but some places remained dull, with prices scarcely supported.

The fourth Monday opened on moderate foreign and small English supplies. A better show of samples was made this morning on the Essex and Kentish stands; but no new was offered. This was a very dull day, the fine warm weather having returned; and though only the previous prices were asked, millers generally refrained from purchasing, and the few offers made were at 1s. per qr. less, which factors finally accepted in many instances, though most was unsold. In the little effected in foreign the same prices were paid; but it would have been difficult to sell much, had samples been offered cheaper. The floating trade was dull, though little changed as to prices.

The imports into London for the four weeks in English qualities were 12,812 qrs., in foreign 49,484 qrs., against 10,422 qrs. English and 139,778 qrs. foreign, for the same time in 1862, showing a decrease in foreign of 90,294 qrs. The imports of foreign for the United Kingdom in four weeks were 369,484 qrs., 344,616 cwts. of flour. The exports from London in the same time were 1,733 qrs. wheat, 19,381 cwts. flour. The averages have varied very little, commencing at 46s. 5d., and closing at 46s. 7d., which is 10s. 4d. below what they were at the same time last year.

With the weather warm and generally fine, and the wheat trade slow, it was not to be expected that much activity would appear in flour transactions; but the duller market was at the commencement of the month on large American receipts, which later on attracted a few French buyers, and hardened prices; but, as a whole, rates have been much the same, Norfolks commencing and closing at 31s. ex ship, and barrels at from 21s. to 26s. Town prices remained the same, with 47s. as their top. Stocks of flour seem increasing at new York, and with declining prices and greater success on the part of the Federals, we may yet have free shipments, but not of fine qualities. The imports into London for four weeks were, in country-make

40,134 sacks, in foreign 2,245 sacks 52,118 barrels, against 45,674 sacks country, 2,501 sacks 63,610 barrels foreign, in 1862.

Through the falling off of foreign supplies, low barley has been gradually increasing in value, English stocks being apparently exhausted or needed by farmers for consumption at home. Some new malting from Kent has been brought to market, for which 40s. per qr. was asked; but hitherto samples have been but poor, and scarcely up to the average of seasons. Old stock being exhausted abroad, it is very likely that grinding descriptions will for some time maintain their value, and if fine new malting is to be as scarce as some expect, it must bring good prices; old Saal at Hambro' was quoted 31s. per qr.; grinding at Alexandria, 26s., at Ibraila 14s., at Algiers 19s. 9d.; but at neither of these places were stocks of any importance.

The malt trade has been steady through the month, with prices firm for the best qualities of pale.

Oats have continued to rule low, from the heavy supplies of the previous month; but though some English new of good quality have appeared, with an instalment from Archangel at the end of the month, prices finished with more firmness, and an occasional advance; 40lbs. per bushel Swedes have brought 21s., the Archangels being light, from 19s. to 19s. 6d. per qr. As respects this grain we are more in favour of an advance than otherwise, though at this season of the year, with the hay crop well got in, much demand is not to be expected. There are, indeed, no foreign ports whence oats can be shipped to meet present rates, and the late importations have brought heavy losses. The imports for four weeks into London have been, in English sorts 1,760 qrs., in Scotch only 33 qrs., Irish 950 qrs., foreign 128,589 qrs., against 4,134 qrs. English, 1,458 qrs. Scotch, 2,337 qrs. Irish, and 79,057 qrs. foreign, in 1862. So though there is a great falling off in home supplies, there is a large increase from abroad, accounting for the reduced rates.

We have had more English beans and less foreign than last year: the only change has been a reduction of 1s. per qr. on the first market, when more than half the foreign supplies arrived. The month closed with more firmness, 32s. per qr, being the price for new Egyptian. The crop in Egypt is said to be deficient this season, and prices quoted at Alexandria were 26s. 6d., leaving little or no margin to importers, with a freight of 4s. per qr., duty 1s., and other expences of metage, and perhaps landing to be incurred.

Very little has been doing in peas throughout the month, and prices have remained pretty much as they were. The stocks of old white in granary (used only for feeding horses) having got low have been moderately increased by imports from the Baltic; but the best are scarcely worth more than 35s. Those fine enough for boiling have not been in demand, though nominally 2s. or 3s. per qr. above these in value. Hog peas have been very scarce, and but little inquired for from their relative dearth.

The Linseed supply has been scanty, and though rates on one good arrival were rather easier, they

COVENT GARDEN MARKET.

LONDON, SATURDAY, July 25.—Supplies of both fruit and vegetables are still unusually well kept up. Peaches and Nectarines are plentiful. Greengages and other Plums are now inclined to foreign imports; and of Grapes and Pine Apples the supply is sufficient for the demand. Foreign Pine Apples are also plentiful. Strawberries are abundant. Cherries of foreign growth, of which there are large arrivals, are fetching from 5s. to 6s. 6d. per basket, weighing about 25lbs. each. Of Melons, both English and foreign, there is a good supply; and Oranges are also plentiful. New Potatoes realise from 8s. to 11s. per cwt. Cut flowers chiefly consist of Orchids, Pelargoniums, Violets, Stocks, Calceolarias, Mignonettes, and Roses.

FRUIT.

	s. d.	s. d.		s. d.	s. d.			
Pineapples, per lb.	3	0	6	Melons, each	2	0	4	0
Grapes, per lb.	2	0	6	Gooseberries, p. punnet	5	0	0	0
Strawberries, per lb.	0	6	1	Lemons, per 100	12	0	16	0
Apples, per dozen	0	9	1	Oranges, per box	20	0	40	0
Figs, per dozen	0	2	0	Do., per 100	5	0	10	0
Peaches, per dozen	10	0	0	Nuts, small, per bushel	14	0	18	0
Nectarines, per dozen	0	10	0	Almonds, do.	15	0	0	0
Currants, per punnet	0	6	1	Walnuts, do.	10	0	0	0

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.			
French Beans, per 100	2	0	0	Tomatoes, each	0	4	0	6
Cabbages, per doz.	0	6	1	Celery, per bundle	1	0	2	0
Pears, shelled, per quart	1	0	1	Rhubarb, per bundle	0	2	0	4
Caiflower, each	0	3	0	Asparagus, per 100	0	0	0	0
Potatoes, York Regents,				Sea-kale, per punnet	0	0	0	0
per ton	0	9	0	Shallots (new), p. bunch	0	0	0	6
„ Flukes, do.	100	123	0	Garlic (new), p. bunch	0	0	0	6
„ Brocks, do.	60	80	0	Lettuces, each	0	1	0	2
„ Ceps, do.	75	85	0	Endive, per score	1	0	2	0
„ new, per cwt.	5	11	0	Horseradish, per bundle	1	0	4	0
Turnips, per bushel	0	6	0	Maize, per bushel	0	2	0	6
Carrots, do.	0	6	0	Parley, per 15 bushels	3	0	4	0
Spinach, per sieve	1	0	2	Herbs, per bundle	0	0	0	3
Cucumbers, each	1	0	1	Salsify, per bundle	0	0	0	0
Artichokes, each	0	0	0	Brocoli, per bundle	0	0	0	0
Beet, per dozen	1	0	0	Vegetable Marrows, each	0	0	0	0

CHICORY.

LONDON, SATURDAY, July 25.—The demand for most kinds is steady, and late rates are well supported.
DELIVERABLE FROM WHARF IN BAGS, EXCLUSIVE OF DUTY.

HARLINGEN	49	0	to	49	15
BRUGES	9	10	to	10	0
ANTWERP	9	5	to	10	0
HAMBURG	9	5	to	10	0

HAY MARKETS.

LONDON, SATURDAY, July 25.—SMITHFIELD.—Trade steady.
CUMBERLAND.—Supply rather limited.
WHITECHAPEL.—A fair demand.

	SMITHFIELD.			CUMBERLAND.			WHITECHAPEL.				
	s.	d.	d.	s.	d.	d.	s.	d.	d.		
OLD MEADOW HAY	70	0	to	90	0	to	70	0	to	90	0
NEW DO.	80	0		80	0		80	0		80	0
OLD CLOVER	100	0		100	0		100	0		100	0
NEW DO.	70	0		70	0		70	0		70	0
STRAW	25	0		30	0		25	0		30	0

At per load of 34 Trusses.

MANURES.

LONDON, July 25.—The Manure trade is dull, and demands little notice. Nitrate of Soda is still selling at the nominally high price to which it has advanced through speculative sales in Liverpool. Linseed Cakes are held firmly at late prices.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from the importers' stores, or ex ship (30 tons), £12 5s. to £12 10s. per ton.
Bones, 25 lbs. to 28; crushed, 25 lbs. to 28 lbs. per ton.
Animal Charcoal, £4 15s. to 25 lbs. per ton.
Coprolites, Camidge, (in London), whole 50s., ground 55s. to 60s.; Suffolk whole 45s., ground 47s. per ton.
Nitrate of Soda, £15 to £16 per ton.
Sulphate of Ammonia, 14s. to 14s. 10d. per ton.
Superphosphate of Lime, 25 lbs. per ton. Fishery Salt, 5s.
Blood Manure, 25 lbs. to 27 lbs. per ton. Dissolved Bones, 25 lbs. do.
Dissolved Coprolites, 25 lbs. per ton.
Limeed Cakes, best American, £10 10s. per hrl., ditto £10 to £10 5s. per bag; English, £10 10s. to £10 15s. per ton.
Rape Cakes, 25 lbs. to 27 lbs. per ton.
Cottonseed Cake, 25 lbs. to 25 5s. per ton.

E. PURSER, London Manure Company,
116, Fenchurch Street, E.C.

	per ton
Promote's Cereal Manure for Corn Crops	25 10 0
Manure	8 0 0
Promote's Turnip Manure	6 10 0
Promote's Superphosphate of Lime	6 0 0

Manufactured by Hodgson and Simpson, Wakefield, and

	per ton
Nitro-Phosphate	25 10 0
Ammonia-Phosphate	9 0 0

LEADENHALL LEATHER MARKET.

LONDON, SATURDAY, July 25.—There has been an improved demand for leather this week, and last week's quotations have been fully supported. Very moderate supplies have been on offer. Raw hides have sold slowly, at late rates.

CROP HIDES.

lbs.	lbs.	d.	d.
25 to 35	11 to 14		
35 to 40	12	16	
40 to 45	13	18	
45 to 50	15	19	
50 to 55	16	21	
55 to 60	17	22	

BUTTS.

lbs.	lbs.	d.	d.
14	16	13	14
17	20	15	22
21	24	15	24
25	28	17	29
29	32	19	30
33	36	20	31

FOREIGN.	lbs.	lbs.	d.	d.
16	20	12	19	
21	24	13	23	
25	28	13	24	
29	32	15	25	
33	36	14	27	
45	50	16	25	

OFFAL.

lbs.	lbs.	d.	d.
English	11	14	
Do. Cheeks and Fares	6	9	
Do. Bellies	7	10	
Do. Middles	9	11	
Foreign Shoulders	10	12	
Do. Necks	9	10	
Do. Bellies	6	8	
Do. Middles	9	11	
Dressing Hide Shoulders	9	10	
Do. do. Bellies	8	9	
Kip Shoulders	4	7	
Do. Bellies	3	6	

DRESSING HIDES.

lbs.	lbs.	d.	d.
Common	24 to 31	10	12
Do.	25	10	12
Do.	30	11	11
Do.	35	12	15
Saddlers	30	15	13
Do.	34	15	17
Bells	18	16	13
Shaved	17	19	14
Do.	20	23	12
Do.	24	26	12
Scotch do.	16	14	13
Cowh, per hide	35s. to 30s.		

HORSE BUTTS.

SHAVED.	lbs.	lbs.	d.	d.
English	19 to 12	13 to 15		
Spanish	10	12	14	

HIDE AND SKIN MARKETS.

LONDON, SATURDAY, July 25.

MARKET HIDES:		s. d.	s. d.	HORSE HIDES, each		s. d.	s. d.
56 to 64 lbs.....	0	3	to	0	3	to	11
64 to 72 lbs.....	0	3	to	0	3	to	6
72 to 80 lbs.....	0	3	to	0	3	to	4
80 to 90 lbs.....	0	3	to	0	3	to	4
90 to 100 lbs.....	0	3	to	0	3	to	4
100 to 110 lbs.....	0	3	to	0	3	to	4
110 to 120 lbs.....	0	3	to	0	3	to	4
120 to 130 lbs.....	0	3	to	0	3	to	4
130 to 140 lbs.....	0	3	to	0	3	to	4
140 to 150 lbs.....	0	3	to	0	3	to	4

FLAX, HEMP, COIR, &c.

LONDON, SATURDAY, July 25.—The market for flax is firm, at £51 to £56 for Elga, £45 to £49 for St. Petersburg, and £31 to £35 for Egyptian. Hemp is very firm, and clean old Russian is worth £41 10s., whilst new qualities command £39 10s. to £40 10s. per ton. Jute is dull, and rather cheaper, quotations being £30 5s. to £29 per ton. Coir goods support previous rates.

OIL MARKET.

OILS.	PITCH.
Olive, Florence, } £1 4 0 to 20 0 0	British (per cwt.) 40 0 0 0 0
half-cheats... }	Arangel 40 0 0 0 0
Linos... 1 0 0 0 0	Stockholm 40 0 0 0 0
Gallipoli (185 gals) 20 0 0 0	
Spanish... 55 10 0 0	
Linseed (cwt.) 2 5 0 0 0	
Rape, Pale... 2 0 0 0 0	
Brown... 2 4 0 0 0	
Od (tun)... 23 10 0 0	
Seal, Pale... 47 10 0 0	
Do. Brown, Yell... 0 0 0 0	
Sperm... 81 0 0 0	
Head Matter... 78 0 0 0	
Southern... 45 10 0 0	
Cocoa-nut (cwt.) 2 4 0 0	
Palm... 1 14 0 0	

RESIN.

Yellow (per cwt.)	1 7 0	1 12 0
Transparent	1 7 0	1 12 0

WHALEBONE.

Greenland, full	420 0 0	420 0 0
size (per ton)	420 0 0	420 0 0
South Sea	420 0 0	420 0 0

WOOL MARKETS.

ENGLISH WOOL MARKET.

BERMONDSEY WOOL MARKET, July 25.—We have to report a firmer market, and higher prices in the farming districts, except Yorkshire and Lincolnshire, which have been losing the advantage they previously possessed over half-bred and South Down wool. The country fairs are nearly over now, and farmers may congratulate themselves on the very high rates they have obtained for their wool—rates brought about doubtless by a deficiency in the production, and a large increase in the consumption operating together. It is expected that these causes will continue to keep up wool at the present pitch, and most likely to raise the price still higher as the scarcity becomes more apparent.

CITY, MONDAY, July 27.—Since this day se'nnight a moderate business has been passing in home-grown wools, at mostly full prices. For export the enquiry has been much restricted; nevertheless, the quotations have been supported. The public sales of colonial wool are progressing steadily at extreme rates.

CURRENT PRICES OF WOOL.

ENGLISH (per lb.)

	s.	d.		s.	d.		s.	d.		s.	d.
Middle hoggets	1	10½	to	1	11½	Combing skins	1	5½	to	1	7
Ditto wethers	1	8½		1	9½	Carding ditto	1	3		1	5
Half-bred hoggs	1	9		1	10½	Head ditto	0	10		1	1
Down tags	1	8		1	9	Nells	1	1		1	2
Down ewes	1	7		1	8½	Broken	1	1		1	2

SCOTCH (per 24 lb.)

	s.	d.		s.	d.		s.	d.		s.	d.
Laid Highland	17	0	to	18	0	Laid Cheviot	30	0	to	30	0
White ditto	19	0		20	0	Laid Cross	18	0		21	0

White Cheviot, 34s. to 42s.

BRADFORD WOOL MARKET, (Thursday last.)—The recent advices from America have had a considerable tendency to strengthen prices in our market for all classes of wools. To-day staplers have been less disposed to give way in their quotations than they were last week, notwithstanding the very limited orders given out by the consumers. The general impression in the trade appears to be that we can expect no great alteration in prices anyway, as long as the present state of things lasts in America, everyone hoping to be low in stock when that difficulty is settled, consequently trading as much as possible from hand to mouth.

DONCASTER WOOL MARKET, (Saturday last.)—Scarcely any wool shown to-day, not thirty sheets altogether. The fair being near at hand, supplies are waiting for that period. Prices, in the absence of buyers, are almost nominal, but we understand they are generally firm for all.

DORCHESTER (OXON) WOOL FAIR.—There was about the usual attendance of buyers and sellers, but the quantity was less than last year. Nearly all the wools offered changed hands pretty readily at from 47s. to 49s. 6d., 48s. being the general figure.

GLASGOW WOOL MARKET, (Saturday last.)—During the week there has been considerably more inquiry for wool in this market, and several transactions have been entered into. The quantity arriving is very large, and spinners are busy picking up the best lots. No alteration can be quoted in prices, which are very firm, and seem likely to be well sustained. For laid cheviots the demand continues active, and rates for good clips are very high.—F. H. McLROD.

INVERARY WOOL MARKET.—Several clips were sold at a good advance on last year's prices. Laid Highland is the chief wool grown here, and the advance on it was from 3s. to 4s. per stone of 24 lbs. above last year. There was a brisk demand for laid Highland, which sold readily at from 18s. 6d. to 17s. 6d. per stone. Some clips of white Highland washed brought from 21s. 6d. to 24s. per stone, and unwashed from 19s. to 22s. Laid Cheviot, unwashed, brought from 24s. 6d. to 27s. 6d., and washed from 26s. to 30s. per stone. Some white Cheviot wool brought 38s. to 42s. per stone.

JEDBURGH RINK WOOL FAIR. The market may be described as a slow-selling one. The prices realised for the various clips were scarcely so high in the majority of cases as at the other Border markets. Mr. Douglas, of Plenderleath's who generally tops the market, sold his clips of Cheviot this

year at 44s.—5s. 6d. above what he got last year. Several other lots brought 42s. to 43s. 3d., but the price given was the highest obtained at the market.

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS, (Friday.)—There is not much demand for English wool, manufacturers for the present being well supplied. Prices keep steady. Colonial wool is in fair demand, and prices are unaltered. There seems little disposition to speculate, partly in consequence of the war rumours which have been floating for some time now. Low wool keeps at comparatively high prices.

LEWES WOOL FAIR opened with a dull sale, and many offers were made which were not accepted. The sellers and buyers, however, soon afterwards came to terms, and a good sale, if not an entire clearance, at remunerative prices, was effected. The prices obtained ranged from 1s. 9d. to 1s. 10d. per lb.

LIVERPOOL WOOL MARKET.—JULY 25.

SCOTCH.—There is a fair enquiry for all kinds, but prices have opened so high at the fairs in the North, that holders of any little stock here are asking considerably more, which for the moment puts a stop to business.

	s.	d.		s.	d.
Laid Highland Wool per 24 lbs.	18	0	to	19	0
White Highland do.	20	0		21	0
Laid crossed do. unwashed	30	0		31	0
Do. do. washed	31	0		32	0
Laid Cheviot do. unwashed	34	0		37	0
Do. do. washed	35	0		38	0
White Cheviot do. washed	40	0		43	0

FOREIGN.—There has been a fair business during the week. The public sales are progressing favourably, which gives a better tone to our markets. The sales of English wool take place on the 28th instead of the 29th as proposed, and the series of East India begins on the 30th, when 14,000 will be offered.

Imports for the week 1,201 bales.
Previously this year 102,630 "

NORTH DEVON WOOL FAIR took place at Barnstaple, and the success with which it was attended is good ground for assuming that a new and prosperous era has been opened in the agricultural interest of the county. The first lot was disposed of at a trifle less than 36s. per stone, and other sales followed, prices varying from 35s. to 36s. 6d.

SANQUHAR WOOL FAIR.—Trade was unusually brisk. Blackfaced and other wools were up from 4s. to 6s. per stone, and prices at this advance were very firm. Cheviot wool was, on the average, 40s. per stone. Dealers were rather backward in giving that figure, but sellers were stiff in demanding it. Laid Cheviot found purchasers at 30s. per stone. Blackfaced was in good demand, and numerous and extensive sales took place. This class of wool shared in the general rising, and sold at from 22s. to 26s. per stone. Among the sales we heard of were—Blackstone Cheviot at 40s., Auchness at 38s. 6d., Seyre at 24s. 6d., Druidhall at 24s., Barr 23s. 6d., Garvois 24s., Pancelos 23s., Lanemark 23s., &c.

TYNDRUIN WOOL MARKET.—A good business was done. A great number of the clips have been consigned to the Edinburgh and Glasgow sales. The most of the clips were disposed of either by consignment or sale. We give the following as the current prices:—Laid Highland from 15s. to 17s. 6d. per stone of 24 lb., or about 3s. 6d. above the average of last year; white Highland, washed, from 21s. to 24s., and unwashed from 19s. 6d. to 22s.; laid Cheviots, unwashed, from 24s. to 27s., and washed from 26s. to 29s.; white Cheviots from 36s. to 42s. per stone.

YORK WOOL MARKET, July 23.—At to-day's market, in addition to about 100 sheets of wool remaining from last week, 132 have arrived, making a total of 232 sheets, chiefly Moor wools. Business ruled exceedingly dull to-day, leaving 165 sheets unsold. Good-bred wools 25s. 6d. to 26s. 6d. per stone, as per count of hog, ewe, and wether fleeces. Moor wools, outside 18s., inside 14s., if very superior and tab-washed 14s. 8d. per stone.



THE ANGEL

A Cow, which had been long the property of Mr. Richard, a Farmer of Litchfield, near London, &c.

Engraved by J. G. Smith, from a drawing by J. G. Smith.



H. Burraud

"Hippopotamus Stalk"

London: Published by Messrs. Colnaghi, 21, St. James's Street, 1861.

E. Haeckel

PLATE V.

ROSETTE; A SHORTHORN COW.

THE PROPERTY OF MR. RICHARD EASTWOOD, OF SWINSHAW HOUSE, BURNLEY.

Rosette, a roan cow, calved June 26, 1856, and bred by Mr. Wetherell, of Aldboro', is by the Earl of Derby (12810), out of Rosa, by Ravensworth (9532), her dam Mason, by Hautboy (10305)—by Raspberry (4875)—by Wellington (5625).

The Earl of Derby, the sire of Rosette, and a light roan bull, was bred by Mr. Thomas Raine, of Gainford, Darlington, in June, 1852. He was by Gaylad (12922), out of Young Strawberry, by The Colonel (5428), her dam Strawberry, by Guardian (3947)—Sally of the Tees, by Magnum Bonum (2243).

Rosa, a red cow, was bred by Mr. Foster, of Newton-le-Willows, in 1853; and Rosette was her second calf.

This famous cow has had a most extraordinary career as a show animal, having taken in her time more than twenty premiums, and these at the most important of our great agricultural gatherings. At the Royal Agricultural Society's Meeting at Chester, in 1859, Rosette took the second prize for cows in milk or in calf, and in the following year, at Canterbury, the first prize in the same class. In 1859, at the Dundalk Meeting of the Royal Agricultural Society of Ireland, she was not only the first of her class, but won the Purcell Challenge Cup, as the

best animal in the show. She took this Cup again at the Cork Meeting of the Society in 1860, Mr. Eastwood winning it for the third time in succession, and thereby securing it as his own property with another cow, Faith, at Belfast, in 1861. Rosette also won the Irish Farmers' Gazette Challenge Cup, as the best animal in the yard at the Spring Show of the Royal Dublin Society in 1859, and the Gold Medal at the same Show in 1860, as the best Shorthorn cow of any age. She has also won a number of other premiums about the country, more particularly in Lancashire and Yorkshire; while she came up to Birmingham last December as a fat cow, where she was awarded, in addition to the first prize of her class, the Gold Medal, as the best cow or heifer in the Hall. She also took the first prize again as the best cow, in the week following, at the Smithfield Club Show in the new Agricultural Hall. Her fate, however, was not sealed here, as she went back to Lancashire, where she produced a live calf, and won the first prize at Rochdale the other day, as, once more, the best cow in milk. Rosette, with all this success in public, has still done well in the herd, having had four calves already credited to her account.

PLATE VI.

"KEEPER'S COME, SIR."

The gamekeeper has two sides to his character; but he comes out pleasantly enough when mounted on his old pony, with a body-guard of favourite dogs grouped about him. Our sketch gives a very clever realization of this; though Flush himself is just at present closeted with the Squire, or wetting his own whistle in the butler's pantry, as he tempts old Trusky with a morning's diversion in the warren, or an entry for the prize-pigeon match. Somehow or other, butlers in country houses have more a taste for the trigger

than anything else in the way of field sport, and we have known one or two very good shots amongst them. But the keeper's name does not everywhere sound so well, and he has had to stand up to some very hard hitting of late. The man, however, is not so much to blame as his master; and the keeper only gets wrong when he has the exercise of too much power, and a position above his place. We may take it as a maxim that it is quite possible to have both foxes and pheasants, and gentlemen have only to insist on this being

carried out. A deal of bad blood would die away under such an order of things, and the huntsman and the keeper meet each other in their summer rambles with anything but the sour look and sullen word that now too often mark their greetings. With such a hope, we could take a new reading of the scene, and picture these two prime ministers dilating over a glass of good ale in the little parlour of "The Chequers," on that wonderful run they had with "my" fox from the church wood. Half-a-guinea a head is all very well, as far as it goes; but in these days, when our great

agricultural societies are giving hundred guineas for race horses, and silver cups for hounds, we would suggest that they might well go a step further, and add another good swinging premium for foxes: "To the shepherd who has reared the most lambs from so many ewes, a great coat and a couple of sovereigns"—and "To the keeper who has reared the most foxes from so many covers, a double-barrel gun and twenty sovereigns." We commend our offer to the consideration of the Royal Agricultural Society.

HARVESTING.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

.. We have now generally completed our harvesting—the most anxious, the greatest of our many agricultural operations. In no corn-growing country is that important in-gathering so varying in its time and in its success as in our island. Within only a few months we have seen our wheat harvest not commenced (1862) till about the end of August, and in 1863 at the close of July. The wheat-growers of Southern Europe, and of other continents, heed little of these things. The producers of Egyptian wheat, in a rainless atmosphere, cut, carry, thrash out, and even store their wheat in the open air. The miserable farmers of the Ukraine do nearly the same; and in Spain, where wheat harvest in its Southern Provinces commences in May, the thrashing floors are not even roofed in. When Mr. W. De la Rue visited Northern Spain to observe the total solar eclipse of July 18, 1860, he tells us (*Trans. Roy. Soc.*, vol. clii., p. 389), that his astronomical instruments reached Rivabellosa on the evening of the 11th. The previous part of the day had been occupied in taking a general survey of the country around the village, with the object of selecting a site whereon to erect his observatory, and he at length settled upon one of the thrashing floors which are to be seen in that country in great numbers in the open fields. It was about sixty feet in diameter, and close to the road, which was, it seems, a great convenience, as the water required for the use of the members of the expedition had to be brought from a great distance. Moreover, it was level, and exceedingly hard and dry. They had scarcely selected their sight when they learned with some concern that the harvest had commenced, and that the proprietor intended to make use of the floor on the morrow for his thrashing operations, which it is the custom of the country to complete immediately after the reaping. It should be recorded, to the honour of the Biscayan farmer, that when informed of the object of the expedition, and that the thrashing floor was the place the best adapted for its use, he at once placed it at the English astronomer's disposal, and although he had to convey his corn to a distance, refused any remuneration.

With us it is only cottagers who, when growing their plots of wheat, are compelled to thrash it in the open air. The thrashing machine, it is true, does the same; but then this operation is usually performed in fine weather by the side of the corn rick, and a day suffices to thrash out a considerable stack. Wheat harvest with us will be this year almost entirely completed when this meets the readers of the *Farmer's Magazine*; but, as I have before remarked, it was long since over in more southerly and warmer lands. It was finished during April in Scinde and China; during May in Murcia, Grenada, Malta, and Corfu; in June in the Castiles, Southern France, and the Northern States of America—times of harvest which are, in fact, regulated

by the different mean summer temperatures of these places. This varies, even in the cultivated districts of our own island, from 54 deg. to 64 deg. It is 73 deg. in the basin of the Ohio; 81 deg. on the great western plain of North America; 71 deg. at Montreal, in the valley of the St. Lawrence; 64 deg. at Toronto; 69 deg. in the valley of the Vistula, in Poland; 70 deg. at Bucharest, in Southern Russia; 77 deg. in Sicily; 85 deg. in Egypt; 76 deg. in the valley of the Tagus near Madrid. From most of these warmer climates than our own, a drier and a finer wheat is obtained, than that of our own island, where, by the skill and industry of its cultivators, wheat is produced at the very verge of latitudes and altitudes where the wheat plant refuses to ripen its seed. Here other and foreign farmers excel us, thanks to their less clouded skies. But let us be content, as well as we may, with our own climate, for it confers upon us great and inestimable benefits at all seasons of the year; keeps our island the emerald gem of the ocean; enables us to go forth into our fields at all seasons of the year; it neither buries our fields in snow for months, nor does it lock up our ports with ice during the winter months. If it does vary sometimes day by day for weeks together, why it renders us energetically restless, and ready for all the positions in which we may be placed. There is no land, I believe, that enjoys an even temperature at all seasons, whether low or elevated, whose inhabitants are worthy of our imitation or whom we envy for anything, except it may be (during a wet harvest) for their unvaried fine weather.

I need hardly warn the readers of this widely circulating magazine against the absurdities of certain weather observers, or the predictors of harvest weather, or the influence of the moon in bringing rain or sunshine. Very erroneous notions are, however, sometimes entertained about "the harvest moon." It is merely the moon which lights us during the time of harvest. The harvest moon was that of May in Southern Spain; that of June in the valley of the Tagus. The influence, if any, of the moon upon animals, plants, and the weather, has never been more than suspected, although in all ages some such mysterious power has been attributed to her (*Deuteronomy* xxxiii. 14). The orientalists assign to her a power over their monsoons or moonsoons, and Lieutenant Jansen (*Maury's Ocean*, 261) suspects, with regard to the land and sea-breezes in the Java sea, that they are influenced by the position of the moon. He remarked that in the eastern outlet of Sourabaya during the east monsoon there is during full moon little land-breeze, and at new moon little sea-breeze. He made the same remark in the gulf of Darien. "And how," continues the Dutch philosopher, "can the uncertain, the undetermined sensations arise which are produced by the clear yet sad light of the moon?"

she who has always great tears in her eyes." It has been suspected, too, adds Jansen, that at full moon near the equator, more and darker dew falls than at new moon. In earlier times than our own, certain seeds were sown in England when the moon was in the increase, other rural operations were to be accomplished when she was in the wane. Arago, by comparing the rainfall records of different countries, concluded that more rain fell during the increase of the moon than during the wane, in the proportion of six to five. If the moon can, however, slightly influence the land and sea-breezes of the East, and the fall of the equatorial dew, we may as readily believe it to influence in some small extent our rainfall, the germination of seeds, or the ripening of our harvests.

We need, however, much more information on these difficult questions, before we can reason usefully on such mystic influences. The past corn year should teach us to be modest in our reasonings, and cautious in our conclusions, in all matters relating to organic life. We had, we all know, a mild and moist winter in that of 1862-63, and every one in consequence felt assured that the wheat plant would be weak, and that it would be ravaged by the grub and wireworm. But how contrary to these apparently reasonable conclusions was the result! Never, perhaps, was the harvest more abundant, or the loss from insects so small.

It is in the western portion of our island that the effect of moisture on our wheat crop is the most severely felt. The plant, as Whitley in his prize report truly remarked, is there too often kept in a state of excitement during a mild February and March, and puts forth its powers above ground when it should be merely extending its roots; and so is frequently cut down by a spring frost, or is injured by a north-west wind. And, again, a continuance of warm, moist weather in the spring produces a great bulk of long flaggy straw, which is pretty certainly laid by the westerly gales or a few heavy showers of rain. A cold, dry March is, therefore, especially desirable in the western side of our island; and this is commonly produced by the cold easterly winds, which, passing over the lands of Germany, cover our island with the dry air of the continent. Then the growth of the wheat plant receives a wholesome check, yet its roots extend into the warmer earth, and thus are better enabled to support the plant with the requisite nourishment during the high temperature of summer in which the plant flourishes so well.

One or two valuable papers have recently appeared upon harvesting, written by able practical farmers, holding their land in different parts of England. Mr. Edwin Eddison, a Yorkshire agriculturist, in his prize essay, has particularly addressed himself to the best mode of harvesting in bad seasons (*Journal Roy. Ag. Soc.*, vol. xxiii, p. 210). He commences with the important question of the best time of reaping. As he observes, corn ripens first in the ear, and next in the straw, whether it be wheat, barley, rye, or oats. "I never yet," he continues, "met with any one who could give me a positive rule to know when to cut corn, and I doubt whether there is any such rule. It has been my practice to take six ears of the corn picked from different places, and cut them off a foot long, including the ear, and strike them smartly on the palm of the hand, when, if the grains fall off, the corn is ripe enough to be cut."

"Much has been said about cutting early, and I decidedly think it is better to cut too soon than too late. To men in the south this early cutting may not be so important, but my harvest rarely begins until September. On the 28th September, 1856, I had neither housed nor stacked one sheaf of barley, and very little of wheat or oats. In the south of England they often begin in July. Contrast the length of day and power of the sun, and it needs no argument to show how important it is for us to

be as early as we can. On Lammas-day, the sun rises about 4 h. 25 m. in the morning, and sets about 7 h. 45 m. at night. On Michaelmas-day, which is often the middle of my harvest, the sun rises about six, and sets about six; the days are rapidly shortening, the dews stronger, the nights longer, and the sun has less power to overcome the dampness; so that, however fine the weather, we rarely can begin to house or stack the corn until half-past ten or eleven o'clock in the morning, and must usually leave work at six or seven at night. Contrast this with Lammas-day, when, the sun being in full power and heavy dews exceptional, you can often cart from six or seven in the morning to eight or nine at night, or about double the time. So much for the benefit of cutting early. But again we come to the question *how* early, and I fear nothing but local experience can answer this question."

As to the use of the sheaves, Mr. Eddison prefers them about nine inches in diameter; these dry in less than half the time required by those that are a foot or fifteen inches.

As to judging of the time when corn is fit to carry, the Yorkshire farmers have a saying: "*It is better to have muck in the stook than muck in the stack.*" "All agree in this adage, but the weariness and anxiety of a wet harvest, with the gloomy clouds or the murky atmosphere of October and November, often drive the farmer to improper haste. Yet the greater the age and experience of the farmer, the more you will find that he has come to the conclusion that there always *has been a time*, and therefore he hopes there always will be one, for gathering in the crop; and whilst the young man in anxiety and haste rushes too soon to his carting in the *hope* that all will be right, the older and wiser says he *fears* it is not dry and waits patiently, as by-gone years of wet harvests have taught him to do. Never in any case house or stack your corn until you can say without a shadow of doubt *it is dry and ready*. To learn whether it is ready put your hand to the middle of the sheaf, and if it be cold or damp it is *not* ready; if it feel dry and comfortable it is ready. When it is ready and the day fine, as soon as the dew is off, throw, or *rather pull* down, very gently, every stook, and let the butt end be put to windward. If it happen that you can expose it to both sun and wind so much the better, unless the wind should happen to be as furious as that which in September, 1860, in a few hours damaged my corn to the extent of at least £240; in such a case put the *ears* to the wind. I name this because a wet harvest is sometimes a windy harvest. In 1860 every stook in a field of 10 acres was blown down; at least three-fourths of the sheaves were carried across the field, and five cart-loads were actually blown over a 4 feet 6-inch wall; many sheaves being found among the trees of a half-grown plantation. Being on the spot and seeing the havoc made in the corn, I at once tried the experiment whether the sheaf would do best with the bottom or the top put to windward. When the butt-end met the wind the sheaf was instantly blown away at the rate of three to five miles an hour, whilst the top end or ears seemed to present a sort of inclined plane to the wind."

The advantage of employing the cart instead of the waggon in harvesting was some years since urged by the late Phillip Pusey (*Jour. Ro. Ag. Society*, vol. iv. p. 805), and in a subsequent period (*ibid.*, vol. vi., p. 898) Mr. E. Toomes, of Whittlesea, determined that a one-horse cart is capable of carrying much more than one-half of what can be carried on a two-horse waggon; or

One-horse cart.		Two-horse waggon.	
Wheat sheaves ...	172	Wheat sheaves ...	207
Corn, cake, &c....	25 cwt.	Corn, cake, &c....	45 cwt.
Bones ...	60 bah.	Bones ...	100 bah.

In *dung carting*, one-horse carts appear to have a de-

cided advantage. Mr. Love has given a table of the economy of both *one* and *two-horse* carts (*ibid.*, vol. vii., p. 225). In this, each boy driving is counted as the fourth of a man tipping. A man is reckoned at 2s., and each horse 3s., per day of nine hours.

	One-horse carts.		Two-horse carts.	
Distance in furlongs ...	3	3	3	3
Time of travelling a revolution ...	15	15	15	15
Number of horses ...	3	3	5	5
Number of carts ...	3	2	5	3
Men filling the carts ...	2	2	4	4
Time of filling ...	10	15	5	7½
Men tipping and driving ...	1½	1	1½	1½
Time of tipping ...	5	7½	5	7½
Total time to each revolution ...	30	37½	25	30
Number of loads drawn...	54	29	108	54
Number of yards drawn...	54	43½	108	81
Expense of horses ...	s. 9 0	d. 9 0	s. 15 0	d. 15 0
Expense of men ...	s. 6 6	d. 6 0	s. 11 6	d. 10 6
Total day's expenses ...	s. 15 6	d. 15 0	s. 26 6	d. 25 6
Expense of carting thirty yards ...	s. 8 7	d. 10 2½	s. 7 4½	d. 9 5
Saving, by one-horse carts, per acre ...	s. 1 7½	—	s. 2 0½	—

A Northamptonshire farmer, Mr. Peter Love, in his Prize Essay advises (*ibid.*, p. 225), that "For the convenience of autumn cultivation, all crops should be cut low and shocked up in straight parallel rows, pretty wide apart, so as to allow cultivation to proceed, even though the weather should retard the carting of the crop. It is well known that bagged, mown, and machine-cut corn does not bind so closely in the sheaf as when reaped, therefore the wind and air more rapidly extract the moisture out of the grain and straw of the former than the latter; also that wet does not so readily penetrate the former as the latter; consequently all those crops that

are bagged, mown, or machine-cut are sooner fit for carting than reaped ones.

"The best situation for stacks is an exposed one, open to both sun and air; and they should not be set too close together, that wind and sun may the more freely operate upon them; also that in case of a fire it may not spread from one to the other; also that the engine and thrasher may be set down on the lee side while thrashing out the grain. The best position for stacks is by the side of a good hard road, and if they are long stacks or reeks, the ends ought to stand north and south, that the sun may shine equally on both sides. We do not believe that the system of setting stacks in the fields where they grow is the most economical; they should be placed on the most convenient spot as near the homestead as three carts, when carrying the crop, can deliver them; on the thrashing day the cavings, chaff, and grain will then be within a moderate distance for carting to the straw-barn and granary, and the straw must be stacked till wanted, when it may be carted home by teams when returning from field-work.

"The working of the portable-engine and thrashing-machine has shown how inexpedient it is to waste a fine day fit for thrashing out of doors in carting crops into the barn, to be there thrashed; in fact, barns to hold crops in the straw are no longer required, and they should be converted into places for preparing food for cattle, or stalls for feeding, with a good plaster-floored granary above. When new buildings are erected, all that is required as stowage for corn is a granary, which should be erected over a good cart and implement shed. Instead of barns, what is now most required are places for cutting chaff, pulping roots, grinding corn, and breaking oilcake; in fact, a food-factory, where the straw, roots, &c., can be manipulated into food containing all the elements found in the richest feeding pasture, which develops both fat and flesh with economy and despatch: thus we may produce a harvest of beef and mutton equal to the requirement of our fast-increasing population."

The facts we have been now considering are full of practical importance. The young farmer can hardly too often refer to the reports like those I have now collected together. He will remember that all his efforts to cultivate and improve his land are rendered abortive if the crops he produces are to be lost or wasted by careless or expensive harvesting.

THE PROGRESS OF THE PLOUGH.

The history of the plough is interesting, whether viewed in a purely mechanical or agricultural light. It is, however, when the implement is examined at work in the field that its true character at the different periods of its existence is practically seen and appreciated; and just now, when the steam horse has been successfully "colted," some difficulty is felt in saying whether it is the plough renewing its age, or only entering upon another era of time-honoured usefulness.

The early plough of our forefathers was constructed on the principle of our modern smashing-up implements, yeilded grubbers, *alias* scarifiers, *alias* cultivators, *alias* this and the next body's "*steam plough*." Examined in this light, it would appear that the implement was about to follow the example of the eagle. But this view of its progress requires a second consideration; for if the experience of the past is admitted in evidence, the proof may be forthcoming that without a turnover the newly-fledged steam smasher may fall short of the utilitarian

character of its ancestor. The application of the modern turnover to the old Roman plough was a work of time. Like the eagle's wing, it grew slowly in length and breadth until it acquired the matured mechanism necessary to turn over the furrow-slice, and lay it in a proper manner for the production of corn and other crops.

But steam, it must be borne in mind, is working the modern turnover plough as successfully as the old smashing-up implement of Virgil; so that when both are examined in the light of progress, their peculiar constructions require a closer investigation to comprehend individual likenesses, and arrive at practical conclusions as to their respective merits, mechanical and agricultural.

The comparative merits of the two implements for the future is, however, not exactly the subject introduced for discussion, the question raised at the head of our paper being one of history rather than the progress of applied science at the present time. We must, therefore, go back to the good olden time, when the Mantuan bard first

touched his rural lyre to the merits of the plough, and bring up our story from the beginning by raising, for solution, the practical question, Was the invention of the turnover to the plough a mistake, or its contrary—a step in the right direction?

Both these questions have long ago been settled at the bar of practice to the satisfaction of every farmer qualified to open his mouth on the subject. The verdict pronounced, too, has met with universal acquiescence; for in every civilized corner of the globe the old smash-ups have been thrown aside, and the turn-furrow plough adopted as an invaluable discovery.

There can be no mistake about the soundness of this conclusion. Even granting that some of the oldest of the old school had fallen asleep, and had only just now awoke from a brilliant dream that the smash-up plough of Virgil was perfection itself, they could hardly rub their eyes and examine the modern turnover plough in the broad daylight of the present age without arriving at the same conclusion. However strong might be the first impulse of imagination in favour of the past, and however persuasive may be the current of selfish circumstances as regards the future, they could hardly be expected to stand out alone for any lengthened period of time a solitary exception to the universal testimony of farmers in general, and say that "*the invention of the turnover was a sad mistake.*" For, as practical farmers, How could they offer Virgil's turn-bow smash-up plough, in proof of their untimely conclusion? They must take us back to the period of the past, when our merry ancestors yoked their teams by their tails to smash-up ploughs, before they can venture to offer practical proof in the field that the addition of a turnover is a step in the wrong direction; and even *there* and *then* it would unquestionably afford intelligent farmers of all grades an infinite source of merriment at their expense.

But, however odd such an exception to the general rule may appear in the light of the present time, it may be taken for granted that when the first turn-furrow-plough was started in the field, many practical farmers shook their heads. It would be difficult to arrive at the opposite conclusion; for at that eventful period in the history of the plough, they, as agriculturists, were practically familiar with all the advantages of the smash-up system of cultivating land, while as yet they knew nothing experimentally about the inversion of the furrow-slice. Like all other great discoveries, the turnover had to win its way through much opposition before it obtained the general confidence of the agricultural body.

For a time the turn-furrow plough, no doubt, experienced in the field some well-merited opposition. In point of mechanism it was, for example, rude and imperfect to a proverb; while the mode of hauling it lay between the same out-of-date parallels. Such being the state of things when examined from a purely mechanical point of view, how could the opinions of farmers be otherwise than divided on the more knotty question of agricultural progress? "It is always more easy to find fault with a new thing than to mend it," so says the proverb; and in all ages of agriculture and corners of the "wide wide world," farmers have manifested an exceptional proneness to the former predilection.

The agricultural question was, however, at that time surrounded with no little difficulty, there being perhaps a larger amount of chemical data involved than mechanical, and the same is experienced at the present day. Were the merits of the plough to hinge upon the purely mechanical question of a turnover for inverting the furrow-slice, they might be satisfactorily disposed of by a single stroke of the pen; but the practical state of things is very differently situated; and if such is the case now, it was still more so then. In referring back, for example, to an old

scientific work, published about two hundred years ago, for the opinions of the more intelligent agriculturists of that period, we find a newly-invented turnover highly approved of, because it laid the furrow-slice flat upon its grassy side in the open furrow behind the team. It must be borne in mind by our professional readers, that before the discovery of a turnover, practical men had no notion of a rectangular furrow-slice being laid at an angle of *forty-five degrees*, although Euclid flourished long before them, and although trigonometry was openly taught in all our Universities; yet such mathematical data had never been applied to the ploughing of lands. The smash-up system of cultivation was then the only one in general practice, so that its advocates had the popular half of the argument in their favour when the turnover first made its appearance in the field. That there were different kinds of smash-up-ploughs—some good and some bad—is one of those self-evident problems that require no proof, and that ploughmen and the work they performed were similarly divided into different qualities are propositions equally true.

The practical question raised by the discovery of a turnover would, of course, be solved in the harvest field. *The best of two crops* would turn the balance either way. Such was the rule by which the merits of the old and new plough would be decided at that time, one that still applies to all similar cases, although liable to be misconstrued as to the mechanical and chemical principles on which it is founded.

It is certainly very interesting, from a neutral point of view, to observe the application of this old rule to the solution of the *converse question*, viz., *the best of two crops* in the case of the old smash-up plough *versus* the modern turn-furrow implement, more especially when both implements are being actuated by steam. It certainly calls upon those accustomed to reduce complex chemical and mechanical questions of the kind at issue to their simplest forms, in order to examine them in the pure light of experimental philosophy, to ask—What are the fundamental principles involved in this old controversy that has thus been so unceremoniously turned upside down in our own day, and so invested with an air of the mystical as to impress the senses with the appearance of novelty, as if it had never stood before at the bar of experiment for practical solution? In other words, there is no novelty in the principle of the smash-up implements now in the field. No one has any right to lay claim to it as a discovery in mechanical science.

"*There is nothing new under the sun.*" So taught one of the wisest of men; and the doctrine is as sound and applicable in the reign of Victoria as it was in that of Solomon; for there is much less novelty in some of the mechanical details upon which the warmest advocates of this system base their claims on public patronage than they themselves appear to imagine. As to the agricultural question between the two systems of cultivation, such is no longer pending; for when they are individually examined as separate and independent systems, the conclusion is manifest that the best of two crops was long ago decided, according to the above rule, in favour of the turn-furrow system, as has already been shown, when its old rival had much more in its favour than it now possesses; and this decision has never been reversed at the bar of experiment, but the contrary. The experimental evidence of our forefathers always merits our most sacred respect; for it is just as conclusive as that of the present day, if not more so, being considerably less mixed up with the chemical data involved under a much more artificial and complicated system of drainage, manuring, and cropping. With regard to the revival of the controversy, that falls to the ground, either for the want of novelty or else existence. In confirmation of the former, the reader's attention may be

turned to the fact that implements constructed on the principle of the modern cultivators have always existed only as auxiliaries to the plough, even before the modern turnover itself was invented; and in corroboration of the latter, history does not furnish a single experiment to prove that the old smash-up system of leaving manure, stubble, and other vegetable matter on the surface of the land is sound practice, and that the turnover system of ploughing such into the land is a chemical mistake. This was the unanimous voice of experience in the olden time; how can it be otherwise in our day?

The turn-over was never invented for the purpose of merely loosening the land, but for covering in the manure, stubble, &c. This is evident from the authorities already quoted. Experience then told farmers, as it now tells them, that, when manure is left upon the surface it is almost wholly lost in dry weather, and that in wet weather the green sods and grass when left uppermost fast take root and choke the corn. Thus taught, the inventor of the turn-over knew that if he could invert the green sod and cover the manure, a very considerable benefit would be gained in fertilizing the land, and expenses saved in the form of labour; for history tells us that a dozen of smash-up ploughings was often necessary to get a single crop—good, bad, or indifferent.

The Kentish turnwrest plough, with the coulter and turn-over removed, is perhaps the nearest approximation to the principle of the original to which attention can be practically turned. If, therefore, any of the farmers of Kent, Sussex, and Hants, who use the turnwrest implement, will throw aside the above very simple appendages, they may then test the efficacy of the first smash-up ploughs introduced into these counties from the continent of Europe, and also the real value of the discovery of the appendages themselves, conjointly and severally.

As to the peculiar mechanism of the old grubber, cultivator, or auxiliary to the plough, many truly-primitive examples are to this day in existence, and even in successful operation, comparatively speaking. They were, and are, constructed in various ways. In principle they may be said to rank intermediate between the harrow and the old smash-up plough, or any plough divested of its coulter and turn-over or mould-board. Indeed, the mould-boards of the old turn-furrow ploughs were frequently removed in cleaning summer-fallows, and in working lands in autumn or spring, when couch grass had to be brought to the surface and removed, and, when under such circumstances, the smashing-up system was found preferable to that of the inversion of the furrow slice. One of the most original of this class of implements we ever saw consisted of the fork of a tree. It had one or two tines or coulters in each leg, and one in the body, where the two legs were united, and was hauled by a *turn-bow-bridle* or

copec. "Slades," "aleds," or "alleges," constructed of the forks of trees, are common in most parts; but the implement in question served a two-fold purpose, viz.—a cultivator, when furnished with tines; and a sledge, when they were removed. It was made by its owner, a practical farmer, with the assistance of the blacksmith, and exemplified sound mechanical principles, by no means without useful instruction to inventors and implement makers.

The more extended use of this class of implements, and the improvements that have taken place in their manufacture during the past thirty or forty years, are much more due to agricultural progress and machine manufacture, than to discoveries made in the application of mechanical principles in the construction of the working parts, upon which their utilitarian merits can alone be based. In other words, when superficial appearances are thrown aside, and mechanical principles examined according to their comparative merits, the rude implement constructed of the fork of a tree is as sound in principle, and as effective an implement in the field, as the best-made cultivators of the present period. We do not say so purposely to encourage the manufacture of the former, but the reverse—to stimulate progress in the simple mechanical principles of construction which it exemplifies; for without such no real progress can ever be made in the manufacture of agricultural implements. This conclusion is as applicable to the turn-furrow plough as to its auxiliary, if not more so; for although the modern mouldboard turns up a more rectangular furrow-slice, squeezes up the furrow-slices more closely together, and is much more easily hauled than its old wooden predecessor, it is questionable if such mechanical odds are not more than counterbalanced by chemical data in the opposite side of the question; for it must always be borne in mind that the best of two crops is more a chemical than a mechanical problem, and that, to make a long story short, chemistry neither likes rectangles-squeezing, nor little draught, but the contrary, in the vast majority of cases. Lazy ploughmen and horses prefer all three; but now that the steam horse is in the field, and the ploughman seated on the implement, it is more than probable that the very reverse of the rectangular-squeezing rule of the present day may be taught in the field before the next generation of our race attains to manhood. Gardeners have long been familiar with the fertilizing benefits a clod derives from a sharp stroke with the back of the spade or digging-fork. There is something of electricity about it perhaps, and for a similar reason farmers prefer a quick step to the slow pace of the snail-creeping plough. The more the clods fly and fritter in seed-time the better the crop in harvest; and the quick pace and electric stroke of the steam-plough is beginning to tell in the same direction.

HARVEST WORK AND ITS RESULTS.

BY A PRACTICAL FARMER.

The various operations in modern agriculture have undergone such a revolutionary change during the past few years that one is often inclined to stand and ask "What next?" There is no farm-work in the present day conducted upon former practice and principles. All have more or less received some modification, either in the execution or in the application thereof—i.e., the manner of executing various farm operations, and the time now chosen for performing these, have changed. Autumn culture is now considered one of the most important improve-

ments ever introduced into agricultural practice. Hence, much of our harvest-work has some relation to those subsequent operations necessary to effect a good autumn culture. Farmers now require their land to be cleared of all the crop, of every obstruction to the plough or cultivator, so that all may work freely. This has caused the abandonment of the reaping hook and sickle altogether in some districts, and to be greatly curtailed in most others; and were it not for the many absurd restrictions with regard to the preservation of stables as a cover for game,

these very old and simple implements for cutting grain would be totally abolished in regular harvest-work.

The scythe has gradually superseded them, to the manifest advantage of the farmer, who has no longer to depend upon the primitive flail as the thrashing implement; but he has the powerful and vastly more effective steam thrashing-machine, to which superabundance of straw is no great hindrance. Hence another motive for cleaning all the crop and stubble away. The thrasher is no more! His "occupation's gone!" and the old *bat, bat, bat*, which was heard resounding from the old barn floor from morning till night, has given way to the coughing of the steam-engine and hum of the thrashing-machine. But the scythe is now in a fair way of being superseded by the ingeniously-contrived reaping-machine, which has become so perfected as to be able to cut the heaviest, the most laid and difficult crops satisfactorily. In every lighter crop they show the very perfection of mowing, and which the scythe cannot attain to.

The practice of mowing wheat is of rather recent introduction, and it has only within a very short time become so general. I well recollect the odium that was attached to every farmer who ventured to adopt this unpopular mode of cutting *wheat*. He might so cut his barley with impunity, and without complaint; but to *mow wheat* was to deprive the poor of a prescriptive right held from time immemorial—nay, long before the time of Ruth the Moabitess; and it was looked upon as a manifest injustice on no account to be tolerated. This prejudice has died away, and gleaners are content to glean after the scythe, and they do it with as much interest as after the sickle, and often with far greater profit; because the scythe in every dead ripe crop causes more ears to fall, which no rake can afterwards gather up. This scythe has superseded the sickle and reaping-hook, mainly owing to the greater expedition it achieves in cutting down the grain. The reaping-machine is now about to do the same, if it has not already done it—*i. e.*, to supersede the scythe, and that owing to the still far greater expedition with which it effects its work. Formerly, the English harvest used to extend over a period of ten or twelve weeks, now it barely occupies four or five, and is gradually becoming shorter every year. The consequence is that all hands and horses are soon at liberty to attend to the autumn tillage, and better farming and more remunerative crops are the result. Moreover, the application of such effective machinery renders the migration of labour unnecessary. The Irish reaper is not so much in request as formerly, and he may ultimately be compelled to remain in his own emerald isle, a boon to its agriculture rather than a clog. No country requires it more, or would pay better for the judicious application of more labour, than Ireland; but if the poor misguided Irish peasant can reach England, he will by work, privation, and begging, obtain a sum necessary for his immediate and pressing wants, and on his return become, from habit, indifference, and idleness, a curse rather than a blessing to his immediate locality. Should, therefore, the demand for his labour cease in this country, he will be compelled to labour at home, where it is so much needed, and thus increase the productions of that "fine country"—the absence of good culture being the great bane of Ireland and its agriculture.

The introduction of the reaping machine into general practice may for a time excite old and ignorant prejudices, but it will soon bring about its own relief. The tendency and the proof alike show that every introduction of power to accomplish labour has also wonderfully increased the demand for it. In this case the time saved in cutting will be appropriated to culture. The steam cultivator or the farm horses at once com-

mence operation; all work goes on simultaneously, and very expeditiously, so that many late crops of green food and many seedings for agricultural seed crops are speedily got in. In other fields a bastard fallow is secured, the seeds of weeds are made to vegetate, the whole farm is cleaned, and broken up for atmospheric influence, so highly appreciated in the autumn, and all is thus made far more productive. But without this expedition being used in harvest work the season is lost, and the work drags on as in olden time; the result the same—a series of inferior crops and unremunerative farming. This in the present day cannot be permitted, or rather suffered. Our agriculture must progress. Mechanicians have provided ample means to promote it. Farmers must take advantage of these aids, and manage accordingly. In the past year the autumn was so fine that many farmers by the aid of steam did secure a good autumn culture, and in the spring had little else to do than promote the prosperity of their crops, not only in the manner of getting in the seed, but in subsequent hoeings and cleanings. He is thus put into the position to choose his own time for his seeding and management. These and many others I might name are some of the collaterals connected with the speedy accomplishment of harvest work.

It may be said that after all you deprive the harvest men of much highly remunerative labour. I don't think that this is a necessary consequence. Every farmer is aiming to do the same thing—to secure his harvest as speedily as possible: he must have abundance of help for the time for that purpose: he is then anxious to proceed with his culture. He cannot part with any men: they are all engaged in one department or other, either of preparation or in actual work on the soil, so that an early season may be secured. It is not less work: it is more expedition, and more cropping. In many cases what beautiful crops of stubble turnips or crops of coleseed may be raised for November feeding, and still the land comes in for wheat! Of course artificial-manuring aids must not be forgotten. On rich soils mangold, turnips, and coleseed would be got in to stand for seed crops; many lands worked and laid up for beans or potatoes in spring. It is beyond the province of any one to tell what may be achieved, if time and power can be secured to accomplish it. The rich soils of the kingdom can be brought to yield alternately very heavy and excellent crops of wheat and potatoes, or cropping requiring a corresponding amount of culture and management. I could point to numerous instances where this course has been pursued, is still in practice, and greatly extending. This is what every intelligent agriculturist will aim to do—*i. e.*, to make every acre of his occupation productive to its utmost bounds, and this I repeat he can only do by great expedition in the autumn. Let, then, no false ideas relative to the introduction of reaping machines, or the adoption of any course which can expedite harvest work, weigh for a moment: depend upon it, more autumn work will ultimately be the result, and more wages will accrue to the labourer, owing to the demand which will be kept up during the later months of the year. This will be in working and cleaning the lands *after garden culture*, the raising of potatoes, mangolds, swedes, the planting of roots for seed crops, the clearing of ditches, reparation of roads, management of fences, &c., &c., besides the preparation of the land, and putting in of the usual autumn crops. These operations, and many others, which every farmer can find to do, will be thus done at the right time, and leave the labourer more time in the winter to attend to the management of the farm stock, for which they will amply pay in thriftiness and economy of food.

THE BEST PLOUGHMAN *versus* THE BEST STEAM PLOUGH.

"A bad hand never yet got a good tool," and in all probability never will. The plan adopted by the Royal Agricultural Society of England in awarding its prizes and commendations for the best work done, and not for the best implement, may be based on the expediency of negation and routine, but it does not accord with this old maxim, which appears to be a standing one. At ploughing matches the prizes go for the quality and quantity of the work performed, and the practical rule is unquestionably based on sound principles. But it does not always follow that the successful competitor has the best plough. There are often deep expressions of regret about this to the contrary, for if Jack Robinson had had Joe Milton's plough it is all but certain he would have left the field with the feather in his cap; but for all that, bad and out of date as Jack's plough was, he licked Joe completely in every respect—both for quantity and quality of work, and also for the best-kept horses; on this, opinion was unanimous.

There is more, too, in the matter than the excellency of the plough, it being a well-authenticated fact that when a good hand gets a new plough of a different but greatly superior mechanism, it takes him a yoking or two to form as it were a professional familiarity with it. Were he to go to a ploughing-match on the morrow, it is more than probable he would prefer his old plough to the new one. Indeed, it may safely be answered in the affirmative as a general rule, that he would rather place his confidence in the implement upon which his experience could safely and practically pronounce judgment, than in the merits of one as yet untried.

There is something in this so oddly anomalous, as to call for practical investigation, as it is evidently calculated to lead many more than superficial observers far astray as to the mechanical merits of the steam plough. When judges thus sit in judgment and pronounce awards, for example, as if the ploughman was the plough (!) and the plough the ploughman (!!), the practical conclusion is manifest; for if the best work is to be attributed to the ploughman at a ploughing match, but to the plough when the implement is the competitor, is it not a practical demonstration that the ploughman and the plough are equal to the same thing, and, therefore, equal to one another? So Euclid taught, in his "Elements of Geometry," upwards of two thousand years ago; such being his first axiom—"Things that are equal to the same thing are equal to one another."

"Agricultural matters, however, are an exception to all rule." So it has often been said; and doubtless the maxim is supported by no small amount of truth, for experimental evidence in the field is a sound method of testing the merits of a plough—one that ought not to be underestimated. The contrary, it may be affirmed, would never meet with the approbation of intelligent practical men, for they form their estimate of value not by what they see others do, but by what they themselves and their own ploughmen can perform.

There are, however, a certain class of farmers whose opinions are considerably influenced by the judgment of others in questions that lie beyond their own immediate experience. And what makes it the more unfortunate for them is the fact that there are at the present time, as there always has been, and perhaps will be, a large number of most obliging super-officials, who press themselves as it were into the DICTATORSHIP, whose judgment is rather of

the routine character; and therefore, like the needle of the mariner's compass, or the line of collimation of the telescope, some correction is necessary for curvature, obliquity, and refraction, in questions of downright agricultural progress. Very possibly this is not altogether the proper expression; but as it is absolutely requisite to say something superlatively plain, the more polished sentimental may advisably be left as an ellipsis for the reader himself to supply.

At all events, a clear problem of inquiry has been made out relative to the case of the steam plough. About this two opinions can hardly be raised. And what is more, past routine is wholly inapplicable to the solution of the modern proposition of cultivating land. The wheel of progress now rolls at a booming velocity, in a totally new line of direction. In point of fact, it is no easy matter for hobnails and rigid leather to keep pace with the steam horse.

To fall behind, however, is not in accordance with modern tactics. On the contrary, the path of duty is plain, for mind and muscle must both be taxed to the maximum, and even trained to keep time to the galloping pace of steam; for if farmers have no experience of the steam plough, they will soon cross "*pons assinorum*" with flying colours.

Science may boast of her golden attributes, and doubtless sound principles will always of themselves command respect in agriculture, as in other branches of art; but making every requisite allowance for the force of this, experience, after all, is the backbone of successful farming. This is one of those self-evident propositions in agriculture, ycleped axioms, that require no proof. At this period of time it were difficult to say how many steam-culture theorems have been enunciated during the past half century; certain it is, the blanks far exceed the prizes as to number: and for perhaps half a century to come the prolific genius of invention will be as fertile in tangents as ever it has hitherto been; so that without a little field exercise, by way of proof, the best informed as to matters of fact could hardly divine how far the force of circumstances might carry the steam plough out of the *right line of progress*.

It is very evident, therefore, that practical farmers require to examine the steam-horse and plough, including the ploughman, somewhat more closely than the work done. The reason of this is palpably plain; for with the quantity and quality of the work they are in some measure at home, and therefore can experience no hesitation as to whether it comes up to the old standard requirements of experience; but between the head and tail of the steam-horse, and those of the old-fashioned plough-cattle, a practical comparison can hardly as yet be satisfactorily drawn, while the plough and the ploughman sweep along the lands from headland to headland at such a marvellous rate as to preclude the possibility of ordinary hands getting a professional hold of both the handles. Figuratively speaking, it may safely be said that a full half of the practical examiners at WORCESTER, including more than one of the DICTATORS, were left topsy-turvy in the open furrow behind the steam plough—an uncommon thing to tyros under the old system.

On this head the practical conclusion is obviously that farmers must learn to ride, march, and keep time to the sonorous boom of the traces. The misty era of gaping, gazing, and looking after, in dizzy bewilderment, is gone;

for he who cannot or will not now nerve both heel and elbow with the best elastic mettle must inevitably be left behind as a nondescript genus of steam-going times. In proof of this, it would be superfluous to advance a single monosyllable.

Since it is then manifest that all must adopt steam culture who aspire to successful agriculture, would it not be advisable to make a distinction between ploughed land, the implement, the steam-horse, the tackle, and the ploughman? In other words, would it not greatly tend to simplify the work of pronouncing judgment as to merit, were the individual parts separately examined and awarded merit, so far as each formed a complete member of itself? And would not this, further, have a greater tendency to stimulate invention in the march of progress, than by lumping the whole together as an individual system, the value of which becomes thus dependent upon any one of its several parts?

That this will ultimately be the plan pursued is manifest, from whatever part of the subject or member of the system steam culture is practically examined. At present, however, the solution of the question hinges upon the propriety of the exception being the rule, on the grounds of expediency. It would be an easy matter illustrating this latter conclusion by having reference to some of the steam-culture systems now in operation; but this we purposely avoid, even to the bare mention of the name of a single patentee or manufacturer, past and present, our observations being confined to the general proposition involved in the march of improvement. Every effort is now being made, for example, to stimulate progress through the instrumentality of united capital. This is based on the commercial maxim that as steam culture has been proved beyond doubt a more than ordinarily successful enterprise, the practice should be at the command of every farmer. The steam-culture field is the most inviting one of the age for the profitable investment of capital, and therefore every encouragement should be given to the general movement thus being made to cultivate the greater breadth of land by steam. Now, in accordance with what has just been said, Steam-culture Companies may for a time find it for their interest to adopt the exception as the rule; but while this is granted, it is equally manifest that due provision should be made for new combinations the moment progress in one branch of the system gets ahead of the advance made in another; for it would be unreasonable to suppose that the several members above-mentioned will keep pace with each other. In point of fact, WORCESTER has already advanced practical proof to the contrary, although we are not saying by this that such proof has been officially acknowledged as yet by the Royal Agricultural Society, or professionally by the agricultural press, as to the peculiar merits of individual members of systems. Indeed, so long as the exceptional routine is the general rule, it will be no easy matter doing justice to individual parts; for the shortcomings of one may counterbalance the

advantages of another, and this will continue while prizes are awarded to whole systems only.

Whole prizes will, of course, experience a similar subdivision, the ploughman coming in for his legitimate share. In point of reality, practically speaking, it is here where the work of subdivision should begin; for, although a system should be divided into a dozen members, and a first and second prize awarded to each, it would be competent, nevertheless, for the owner and exhibitor of any one system to carry off all the prizes; hence, whole systems would suffer no harm, while individual members of it would gain an advantage.

With one exception we shall leave the work of subdivision in the hands of the reader, and this exception is the ploughman. Special encouragement cannot too soon be given to those practically in the management of the steam-plough, including the engine-man, anchor-man, and rope-porter boys, as well as the ploughman himself, to acquire the highest degree of professional skill and handicraft; for upon efficiency in this department much of the general success of the whole depends. If, under horse-culture, farmers have always placed the highest value upon the talents of their ploughmen, the maxim will be found to apply with tenfold effect to artistic skill under steam-culture. They may also find that the best ploughman under the former system is not the most promising and successful under the latter, owing to the wide difference that exists between the two, both as to professional skill and manipulation. In horse-culture much of the success of the ploughman at a ploughing-match depends upon the control he possesses over his team; but it often occurs that the best horseman is not the most efficient when placed in charge of machinery of any kind. There are no doubt talented ploughmen who can put their hand to any subdivision of labour on the farm; but, conceding to the soundness of what is every day experienced, it will generally be found, even in their case, that they prefer some kinds of work to others, and always excel most when the mind and hands work together. With this the practical reader must be familiar, and hence will also appreciate the force of the rule, *the right man in the right place*, when applied to steam-culture, and the present propriety of cultivating special talents in this department wherever they manifested themselves as naturally genuine. At all times natural talents merit special patronage; but the case of the steam-plough at the present time has a more than ordinary claim upon the attention of agriculturists and steam-culture companies. Eventually, a steam-ploughing match will be no novelty; but as yet the proposition requires to be approached with some degree of prefatory caution, for something prior to prizes is needful, to qualify our modern Corydons to steer the steam-plough successfully in the field of competition. There is no want of mechanical talent amongst our clod-plodding rustics to control the steam-plough, but an apprentice fee must nevertheless be paid before success can be attained.

STEAM CULTIVATION.

A meeting of agriculturists of the county—both landlords and tenant-farmers—was recently held at Worcester, to consider the subject of steam cultivation and its practical application. Mr. E. Holland, M.P., presided, the attendance including Lord Northcote, the Hon. F. Lygon, M.P., Sir E. A. H. Lechmere, Bart., Hon. H. F. Vernon, M.P., Mr. R. Padmore, &c.

The CHAIRMAN, in opening the proceedings, said everybody must be so convinced of the advantages of steam

cultivation, that the only question was as to how it could be applied to a particular district or county. Those who, like himself and his neighbours, had tried it for four or five years, would just as soon think of going back to the old flail for thrashing as returning to the old horse plough. To provide the means of steam cultivation much capital must be expended, and what was now proposed was that they should aid and assist one another through the medium of a limited liability company. They had the experience

of more than one such society. There was the experience of one at Gloucester, which had expired (or rather lapsed, for he hoped and believed that in course of time it would go on again) after a year and a half's existence, and its failure was to be attributed to the fact of its being established at a time when all the machinery was new and non-perfected. Since then a very successful society had been established at Wakefield, and had adopted the system of the double engine, such as had been at work during the late meeting of the Royal Agricultural Society, and the consequence was, that instead of having one engine, they had two, of several horse power, which, when not cultivating the land, were employed in going about from farm to farm, and performing other agricultural work. It was suggested that the projected company should commence operations with two engines, and adopt the system of double machines. A great deal of the want of success at Gloucester arose from their trying to do too much at once. They had five engines, only two of which were ever in work at one time, the result being that they had a great deal of dormant capital and a quantity of expensive machinery on hand that was very liable to be broken or injured. Added to that, the mode of cultivating was not understood so well then as now, and the experience of the Gloucester Society would enable them to avoid those errors into which those who had gone before them had fallen. There was nothing, they all knew, for their stiff clay land, like autumn cultivation; but he had found that when he attempted autumn cultivation with horses, he was stopped by the climate. With the steam plough, however, he had accomplished in one fortnight what would have taken him two months without steam. He did not care for seasons, and he had been able to dispense with one-third of his horses. The cost of keeping a horse would, of course, vary with the number kept; but with nine horses it would amount, inclusive of food, value of horse, and wear and tear of gear, to not less than £26 a-year; and if they could

save three times that by only keeping six horses instead of nine, it would be equal to a saving of £78 or £80 a year. Besides, the nature of clay land was so completely altered by the steam plough that it became as fertile as a kitchen garden. The object of this meeting was to bring this powerful agent within the reach of the agriculturists of that county. The following resolution was afterwards adopted, on the motion of Lord Northwick, seconded by Mr. Vernon, M.P.: "That the successful application of steam power in the cultivation of the soil is now placed beyond doubt, and its great value universally admitted; means should therefore be taken to secure its employment in this county."—The second resolution, moved by Sir E. Lechmere, and seconded by Mr. Lakin, was to the following effect: "That, inasmuch as the cost of a steam engine and tackle far exceeded the means of most tenant farmers, it was desirable to establish a joint-stock company for providing such machine 'by hire or purchase.'"—Mr. T. G. Curtler then proposed that a capital of £3,600 should be raised, in the first instance, in shares of £1 each, to provide two sets of implements. He found that the cost of the implements used by the Wakefield Society was about £1,550 each, with thrashing machine. They must employ proper persons to manage the engines, from the want of which many failures had proceeded. They would also want some capital to bear the expenses of carrying them about, and to provide for those items, and to buy implements, the sum of £3,500 was proposed. There was no intention on the part of the promoters of this scheme to confine its operation to shareholders, but its benefits would be offered to all parties on such terms as the committee might hereafter determine.—The motion was seconded by Mr. West, and unanimously adopted.—A provisional committee having been appointed, the proceedings terminated with a vote of thanks to the chairman, moved by the Hon. F. Lygon, and seconded by Mr. Parker.

THE HOP HARVEST.

The hop harvest, on which so much capital depends, is now at hand, and not merely are the one hundred hop-factors and merchants of the metropolis interested in it, but the brewers of this and many other lands watch the result with excitement. Success or failure to many a cultivator is pending in the balance; and although there is now no duty at stake, yet the yield is full of speculation. The harvest may, as has been observed, give a ton to the acre, and twenty guineas to the ton; or it may produce a hundredweight unsaleable in the market. The heavy outlay for manure and high cultivation may be lost, or may bring in a golden return. In regard to delicacy of flavour, brightness of colour, and perfection of curing, English hops maintain their well-merited high reputation over all other growths, notwithstanding the foreign supply is pretty liberal. We are still the largest producers, although a few other countries are now running us closely.

Hops are grown in the Netherlands, Denmark, and Greece, but of very inferior quality. Belgium grows largely; but the Belgian hops are usually badly picked, with too much stalk and green leaves, and have a smell of smoke from bad curing. There are, however, exceptional samples, which indicate that, with proper care, the value of Belgian hops might be greatly enhanced in the London market. In strength, or amount of lupuline, the hops from Bavaria and Bohemia can hardly be surpassed, while, for the most part, their curing is excellent. The supplies from other German States (often represented as Bavarian) are generally of fair moderate strength of flavour, but too

often badly cured and picked, with too many green leaves. In France, within the last quarter of a century, considerable attention has been given to the culture of the hop, especially in La Franche-Comté Alsace: the departments Du Nord, Lorraine, and Vosges; in these localities about 800 or 400 hectares are under culture with the hop. Besides the home production used locally, France consumes foreign hops to the value of 2½ million francs or more yearly, as foreign-grown are preferred by the French brewers, although they cost double the price of those raised in the country. The hops of Alsace and Lorraine were reported by the jurors of the late International Exhibition to be of excellent flavour, but somewhat deficient in strength. They are carefully picked, and in some cases very well cured. A large quantity of French-grown hops are bought by the Germans, and re-shipped to this country as Bavarian hops.

The import of foreign hops into the United Kingdom has not increased very greatly since the removal of the duty, although we still draw on the Continent for a large supply. In 1860 the imports were, in round numbers, 69,000 cwt.; in 1861, 149,000 cwt.; in 1862, 133,800 cwt., and in the first six months of this year, 66,742 cwt. A very small quantity of these foreign hops is re-exported. One-fourth of our extraneous supplies of hops is now drawn from North America, where the culture seems largely on the increase. The hops from Canada and the States, in the opinion of the best judges, still exhibit the disagreeable flavour which renders them quite unsuitable for fine quali-

ties of ales. The hop seems to have been introduced into North America nearly two centuries and a-half ago. The growth was encouraged in Virginia by legislative enactments in 1657. The total quantity raised in the States, according to the census returns, was in 1840 1,238,502 lbs., in 1850 8,497,029 lbs., and in 1860 11,010,012 lbs. The exports from America have been as follows:

1851	110,860 lbs.	1855	4,021,816 lbs.
1852	338,008 "	1856	1,048,515 "
1853	245,647 "	1857	924,588 "
1854	360,026 "	1858	453,889 "

Of later years we have the value only, but not the quantity. Thus, while the exports for 1858, 1859, and 1860 were represented respectively by 41,704 dollars, 53,016 dollars, and 32,866 dollars, the shipments of 1861 reached the high value of 2,006,053 dollars. In Russia a variety of the hop grows wild, in the Taurida, the Ural, and the Altai; but the principal supply is imported from abroad. In Portugal also there are wild hops, which indicate the possibility of successful cultivation there.

The yearly consumption of this narcotic substance in the United Kingdom exceeds in weight that of tobacco, general as is the use of this odoriferous weed. The hop gardens of Kent, Surrey, Sussex, Hants, Hereford, Worcester, and other localities, are now in their full glory. The value of the hop is well described in the rhymes of Old Tusser, who lived in the time of that eighth Henry, the monarch who would have none of "the pernicious weed" in his flagon:

"It strengtheneth drink and flavoureth malt,
And being well brewed, long kep it will last,
And drawing abide, if ye draw not too fast."

A very different kind of malt-liquor is that in which hops are infused, to the malts manufactured in England three centuries ago. An old author, Parkinson, writing in 1640, says: "The ale which our forefathers were accustomed only to drink, being a kind of thicker drink than beere, is now almost quite left off to be made, the use of hoppes to be put therein altering the quality thereof, to be much more healthful, or rather physcall, to preserve the body from the repletion of grosse humours which the ale engendereth."

We trust that the gloomy prognostics of a deficient crop may not be realized, but that the hop-grounds will yield abundantly; for, in the words of a daily contemporary, "If all turns out well, the cultivator is a happy man; he can dispose of his harvest at magnificent prices; but he must pay a heavy rent, literally make the soil, pick, dry, and bag his crop, and then possibly find the market glutted. Dearth at one time and glut at another have formed the rule, generally speaking, in the hop trade. Growers have been known, after keeping the commodity for some years on hand, until it has become so much rubbish, to export it for the sake of the drawback, and throw their entire stock into the German Ocean. Moreover, at times the great brewers have inflicted injury upon the growers of hops by resorting to cheaper substitutes; not one of which, we are glad to think, was anything but an abominable failure. No: experiment as we may, we must flavour the golden floods of the Trent with the early September pickings; and nothing, no matter for how many ages 'cooled in the deep-delled earth,' will rival the full-bloomed and powerful hops of October."

ASCENSION OF SOLUBLE MATTERS IN THE SOIL.

[TRANSLATED FROM THE FRENCH.]

Some interesting experiments were made at Sienna during the year 1861 by M. Egidio Polacci, Professor of Pharmaceutical Chemistry at the University of that town. These experiments were intended to prove that soluble substances which exist in the lower beds of the soil rise regularly to the surface, and that whilst they remain there the volatile parts which enter into the composition of these substances disperse, whilst the fixed portions are left there till rain carries them more or less into the bosom of the earth.

The experiments of M. Polacci are interesting to the agriculturist, because they explain the action in the soil of matters which serve for the development of vegetables, and point out the necessity—already demonstrated, however, by experience and custom—of using certain substances for retaining in the soil the useful principles which are apt to evaporate. Ammonia is the essential base of manures, from the quantity of azote which it contains; it enters in a large proportion into rain water, dew, and fogs; conducted by atmospheric waters, it descends into the lower beds of arable soil, and if there be nothing there to fix it, it soon reascends, loses itself in space, and thus renders no service to agriculture. Experience has already taught us the utility of sulphate of lime, commonly called plaster or gypsum; but the service which it renders are due in a great measure, as we have long since learned from M. Liebig, to the property it possesses of fixing the ammonia. It forms an ammoniacal salt, which, subject to the law recognised by M. Polacci, descends first into the soil, afterwards reascends under the influence of capillary attraction, conducted by the

water, which serves as a vehicle, and reaches to the roots of the plants, and conduces to their development.

The result of M. Polacci's experiments proves that water acts principally in the vegetable organism as a vehicle of nutritive substances.

In order to see whether water acts upon plants rather as the vehicle of nutritive substances than in any other manner, he took four flower-pots, and fixed in the bottom of each a glass tube 35 centimetres long. At the top of two of the tubes he put a coarse horse-hair cloth; at the lower part of the two others he fixed two small cloth bags; he filled the pots with the same kind and the same quantity of earth, which descended into the tubes furnished with bags, and remained on the horse hair; he then put into each pot two bean-seeds, which he watched carefully till they germinated.

He then placed the flower-pot in such a manner that one of the two covered, and one of the open tubes, were plunged into water, whilst he immersed the lower part of the second covered tube into liquid-manure, and left the second open tube entirely free. He left the four plants to vegetate by themselves. At the end of eight days the plants in the two open tubes were dead; the two others survived; but those which corresponded to the bag plunged into the liquid-manure attained an immense growth, and were the only ones that bore fruit.

It became evident then that water alone has but very feeble action upon a plant, and those which held in solution azoteous matters had carried with them, under the influence of capillary attraction, the saline and fertilising properties of manure to the roots of the plants. The

water had then served rather as a vehicle than a nutritive principle. M. Polacci, in order to show better the ascension of soluble salts under the influence of capillary attraction, made the following experiments:—

Taking twelve tubes of 4 centimetres in diameter, and 15 centimetres long, divided into centimetres all the way up, he filled them with earth, and plunged the lower part of each separately into solutions of different salts, such as nitrate of potash, chromate of potash, sulphate of ammonia, &c.; each solution was of a decilitre of water, and contained half-a-gramme of salt; it held the body of the solutions by the adjunction of distilled water; and after twelve days the analysis of each centimetre of earth showed that the major part of the salts had risen to the highest division, whilst the solution contained none. This experiment proved then, as well as several others described by M. Polacci, and made in open land, the ascension of saline substances through the soil, and that ascension takes place, however small may be the quantity of these substances belonging to the soil itself, or which has been introduced there.

These facts are daily occurring in nature. The efflorescence of sulphate of magnesia and carbonate of soda, which may be observed in droughts upon clays in the province of Sienna as well as in the middle of France, proceed from the same causes. It is the same with nitrate of potash, which is gathered on the surface in Spain, Italy, Algeria, &c., and in the Indies.

By another series of experiments M. Polacci proved that ammonia, free or carbonated, also rises to the surface of the soil, where it evaporates and disperses into the air. He explains in this manner the fertilizing action of sulphate of lime, the presence of which hinders the dispersion of the major part of ammonia. In fact, numerous analyses made of earth, taken from different places, at various depths, some after rains, some after a time of drought, have shown notable changes in the proportions of the salts which these earths contain. These analyses prove that salts descend in rainy weather, and tend to rise to the surface in dry weather. M. Polacci concludes his labours with the following remarks: "That soluble substances sometimes rise and sometimes descend into the soil. They descend during rain, and rise in dry weather; or, more generally, they descend during the winter, escaping from the abundant rains, which disperse the major part of them; and rise during summer, when the evaporation is greater, and when vegetation requires more water and food. That the composition of the surface of the soil is very variable. That it may not be the same during one month. That the analyses made now upon lands taken ordinarily at the surface may no longer be considered correct. This is the reason," adds M. Polacci, "that analytical results obtained here at different epochs are so variable; and it is from the same cause that practical agriculture up to the present time has derived so little benefit from experiments of this kind."

ALFRED CAILLAUX.

THE UTILIZATION OF SEWAGE.

SIR,—You will do good service to British agriculture by inserting the following very important letter from Baron Liebig. It settles definitively the question, hitherto much disputed, of the value of a ton of town sewage, taken at its outlet.

How much is to be deducted from that value for conveyance to the fields is another part of the question; but it is generally admitted that from one farthing to three farthings per ton, according to elevation, would be an ample deduction. It is strange that our Legislature or Government has never, by a committee or a commission, elicited engineering data on this point. At Croydon the cost is not more than one farthing per ton: at this rate there is ample scope for profit to the ratepayers as well as farmers, at Baron Liebig's estimate of fourpence per ton.

Hitherto nearly all our attempts at sewage irrigation by means of steam power, pipes, hose, and jet, have been imperfect, from a want of sound engineering skill; hence they have been unduly costly. A mistake of an inch in the diameter of our supply pipes may increase our expense of delivery 100 per cent.

When once we are agreed as to the value of a ton of town sewage, delivered on the land, we shall not long differ as to the propriety or profit of applying a given quantity per acre. Those who now advocate 10,000 tons per acre per annum will be brought, by the questions of cost and value, to much more reasonable conclusions. 10,000 tons per acre, at Baron Liebig's estimate of fourpence per ton, would amount to £166 13s. 4d. Many farmers would be astonished at our even proposing to expend £5 per acre in manure or guano—what would they say to £166 13s. 4d. per acre?

We are all gradually coming to believe in Liebig's great theory, that in order to build up a perfect plant we must have all the necessary materials or elements in due proportion and

in a fit condition. No one certainly would doubt this, if applied to a house; for, wanting either lime or water, useless would be the bricks, timber, slates, and other materials.

I am, Sir, your obedient servant,

Tipfree Hall, Kelvedon, Essex,
Aug. 15th, 1863.

J. J. MACUL.

UTILIZATION OF SEWAGE.

SIR,—The agitation at present going on regarding the application of sewage to the purposes of agriculture induces me to offer a few remarks, which may perhaps assist to throw some light on the different questions belonging to this most important subject.

It seems to me that, on the whole, people have not a correct idea of the matter. In the last twenty years a new branch of industry, which did not before exist, has developed itself on a large scale, and in like manner the importation of guano and the sale of various manures have increased to such an enormous extent. The manufacturers of and dealers in manure are, on principle, inimical to the utilisation of sewage, and in the battle which is being fought they constitute the inimical army whose forces should be by no means underrated.

The contest which this question has renewed is an old one—the contest, namely, between the commercial and industrial and the agricultural interest. The manufacturers of artificial manures fancy their business would stop if it should once happen that the towns supplied the farmer with the necessary manure. If we examine the matter thoroughly we shall find that the anxiety of the manufacturers and dealers in manure is like the panic of the carriers on the eve of the introduction of the railroads. They also feared that the rail would put an end to their business. Yet we know that, owing to the greater traffic, the number of horses in use has since then everywhere increased. The sewage question is most intimately connected with the manufacturers of manure: so much so indeed that the latter may derive from it the greatest profit. It may even be said that it is in reality the manufacture of artificial manure which gives to sewerage its peculiar value and importance for the purposes of husbandry, and it is this which I shall endeavour to explain in what follows.

It is well known that the manufacture of artificial manure is based on the doctrine that the nourishment of all cultivated plants consists of inorganic or mineral substances. Manure consisting of organic substances can be produced by the agriculturist only. The farmer produces farmyard manure; the manufacturer, on the other hand, mineral manure, with which he furnishes the farmer with those efficient elements wanting in stable dung. The most important fabrication is that of superphosphate of lime. The question of immediate importance to be decided is the value to the farmer of the sewerage used, and it is easy to find this by comparing sewage matter with guano, the effect and price of which are known to the farmer, and of whose value he is able to judge. The problem to be solved is, therefore, how much of the efficient elements of guano a farmer can convey to his field in a ton of sewage; or how many gallons of sewage water are equivalent to a cwt. of guano. Regarding the component parts of the best sorts of guano, we have certain and reliable data: those relating to sewer water are less so; but we might long ago have been fully informed of its average contents if, last year, at the mouth of each sewer in London, five gallons of water had been collected morning and evening every day during the week, and at the end of the seventh day one gallon of the collected seventy gallons subjected to chemical analysis. It would be necessary, of course, to determine as nearly as possible the quantity of water discharged at each sewer. Lacking more certain data, I take Professor Way's analysis of sewer water, which this most reliable chemist made at the request of the General Board of Health.

I reckon that Peru guano contains 14 per cent. of nitrogen (= 17 ammonia), 12 per cent. phosphoric acid, and 6-10ths per cent. of potash. Professor Way analysed the water of two sewers, one in Dorset-square, and the other in Barrett's-court, and found in one gallon of sewer water—

	Barrett's-court.	Dorset-square.
Ammonia	41.18 grs.	17.96 gra.
Phosphoric acid ..	10.44 "	4.17 "
Potash	48.18 "	3.32 "

The difference in the contents of the two sewers is very great, for the first contains 29 more ammonia and phosphoric acid, and fifteen times as much potash as the other. According to the analysis of Dr. Hoffman, Frankland, and others, I am of opinion that I may take the contents of the Dorset-square sewer water as the average standard for my calculation. From the above figures it results that 101 tons (20,200 gallons) of this sewer water contains the same amount of phosphoric acid, more than three times as much ammonia, and sixteen times as much potash, as one cwt. of the best Peruvian guano.

It will be observed that there is a great difference in the proportion of phosphoric acid to ammonia in guano and sewer water. In guano this proportion is 6 parts of phosphoric acid to 8½ parts of ammonia; in sewer water this proportion is 6 parts of phosphoric acid to 26 parts of ammonia. The reason of this disproportion in the amount of phosphoric acid and ammonia in sewer water is at once perceived, if we remember that the bones of the slaughtered animals do not find their way into the sewers. These bones are, however, the manuring matter in which phosphoric acid abounds, and their component parts, let it be well understood, must be given back to the fields if it be intended that the soil shall retain its fertility. Potash and ammonia are, according to their prices, far more costly manures than phosphates, and in many cases quite as necessary for the field as this latter can be. Potash and ammonia are wholly inefficient and useless without the presence of phosphoric acid, but with the addition of phosphates they become efficient and valuable. The manufacturer of manure is not able to supply potash and ammonia to the farmer in sufficient quantity, and at an available price, but it is easy for him to collect the bones and make up the deficiency of phosphate by drawing it from natural sources.

It will, I think, be now perceptible what connection there is between the manufacture of superphosphate and the utilisation of sewage. If the farmer add to the sewage water the phosphate which is wanting in it, the efficiency of the water will be increased. Thus 101 tons of sewer water to which 120 lbs. of superphosphate have been added are equivalent to 305 lbs. of Peruvian guano, and the value of the sewer water will be 305 lbs. of guano, at £13 12s. 6d. a ton, 498 pence; from this subtract the price of 120 lbs. of superphosphate at £5 5s., 76 pence; which gives the value of

101 tons sewer water, 422 pence, or 4d. for one ton. It must not be forgotten that sewerage without the addition of phosphate is of much less value, because, if the farmer were to give the soil, in sewerage, as much phosphoric acid as is in 305 lbs. guano, he would have to apply 305 tons of sewer water (instead of 101 tons), which would give the value of 1½d. per ton. I am of opinion that the proportion of ammonia which is brought into the soil by dressing the land with Peruvian guano is much too large and even noxious for future crops; but this does not belong to the present question.

From exact calculation of the liquid and solid voidings of London (the detail of which would be out of place here) we may conclude that 42 tons of ammonia, 10 tons of phosphoric acid, and 7½ tons of potash find their way into the London sewers daily. These 42 tons of ammonia are contained in 247 tons of guano, the 10 tons of phosphoric acid in 83.3 tons guano; thus 163.7 tons remain in which the phosphoric acid is wanting; or, what is the same thing, if to the sewage obtained daily from London 100 tons of superphosphate of lime (at 20 per cent. of phosphoric acid) be added, the value of the daily voidings of the metropolis, or the sewage of London, is made equivalent to 247 tons of Peruvian guano; or, by the addition yearly of 36,500 tons of superphosphate, we may acquire the value of 90,165 tons guano, at £13 12s. 6d.—£1,228,364. Deduct the price of 36,500 tons of superphosphate, at £5 5s.—£191,628, and we have £1,036,736 as the money value of the sewage. To this should still be added the worth of the potash in the sewer water. Potash is the manure which the farmer obtains with the most difficulty: it is that element, too, which renders his stable dung (the amount of phosphoric acid and ammonia being the same) of greater value and efficacy. In 247 tons of guano about 1½ tons of potash are contained; but every day 7½ tons are obtained in the sewer water, which gives a surplus of 6 tons, corresponding to 11 tons of sulphate of potash, giving yearly 4,015 tons, which, at £18 per ton, shows a money value of £72,270. Add this to the sum above given, and we have, as real annual money value of the London sewerage, £1,108,006.

The surplus potash won from the sewer water daily corresponds to the amount contained in 866 tons of stable dung. Without the addition of the superphosphate, the value of the sewerage of London would only be £304,045. In the calculation of the value of sewer water there is one factor doubtful, viz., the absolute amount of phosphoric acid, ammonia, and potash which a ton of acid water contains. It might, probably, be found that some sewer water was richer, another more diluted or poorer in these component parts, but in the relative proportion I do not think that any very great difference would be found. Sewer water will, in the average, contain more potash than I have allowed for, inasmuch as the fluid voidings of horses are to be added, which increase the amount of potash. We may assume that one-third of the population of Great Britain, or ten millions of men, live on corn and agricultural produce imported from abroad. For this a pretty considerable number of millions of pounds sterling must be paid, besides another pretty considerable number which must be earned by the nation, in order to pay for the purchase of manures to produce the food of the remaining 20,000,000 of inhabitants. Many superficial observers appeal to statistics, which appear to show that much of the land yields one-third more than it did in the last century, and this is not, they say, a sign of decrease of fertility; but they forget at what costs their larger crops are obtained, and that they are due to an enormous expense of capital for the purchase of foreign manure. It is a sign of a poor or an exhausted soil, if, in order to get high returns, we have to add large quantities of manure from without; a rich or fertile soil does not require such an addition.

The employment of sewerage in agriculture could make it possible to bring large tracts of land into cultivation which hitherto, owing to the expense of tillage, had been laid waste and neglected; others, too, might be so improved as to make the crops remunerative, and good yields would bring in a larger revenue. The vast capital which hitherto has left the country to pay for corn and manure might be kept at home and employed for other purposes. Should the present state of trade and industry not materially change, a great part of this capital would be devoted to agriculture, and the natural consequence would be that the increasing population would find ample occupation in husbandry. Great Britain is large enough, if we take the arable surface of the land, to pro-

duce all the corn and meat necessary for its inhabitants. It is neither fantastic nor ridiculous to believe that, without purchasing foreign manure, and by a judicious utilisation of the sewage of towns and villages, England would be able to dispense with the importation of food from abroad. For her it would be a blessing if the application of capital to agriculture were found sufficiently profitable to awaken speculation in this direction, so that the industrial population, manufacturers, and tradesmen might devote themselves to the production of bread and meat. These men are quite of another stamp, and care little for tradition or the authority of custom. They know their multiplication table, however, and in competition with such men the farmers would find it impossible to persevere in their old jog-trot ways. The change thus brought about would be as great as after a revolution.

I am, sir, your obedient servant,

JUSTUS VON LIEBIG,

President of the Royal Academy of Science, and Conservator-General of the Royal Scientific Museum.

WHY NOT GROW FLAX ?

The cotton trade in Manchester and the surrounding districts has reached enormous proportions during the last half-century. Immense fortunes were made, which, in some cases, were invested in land; a school of politicians arose from this branch of industry, which attempted on various occasions to prove that the cotton-interest was superior to that of any other in the kingdom, whether connected with agriculture, shipping, foreign trade, or the like. Suddenly, however, the civil war in the United States demonstrated the fact, which had often been predicted previously, that cotton was not such an absolute monarch in this country as had been imagined. A collapse was the result; and while the nation cheerfully responded by liberal subscriptions to the cry of distress, ingenuity tried to find a substitute for the raw material which had hitherto employed thousands of hands, as well as contributed to the national prosperity. A gleam of hope shot through the darkened horizon when it was announced that *Zostera marina*, a brittle sort of sea-weed, was about to supply the place of the plant from the Southern States; but a moment's inspection of this proposed substitute at once dissipated the illusion, and the hopes of the nation then centred on flax. Now, flax is a substantial fibre. It has always been cultivated in this country. Queen Elizabeth insisted, in her arbitrary way, on its being grown in certain proportion to the breadth of arable land. The ancient Assyrians and Egyptians were in the habit of clothing themselves in purple and fine linen; and any person who has seen an Egyptian mummy unrolled, of any date pretending to antiquity, must have noticed the almost innumerable folds of linen with which the whole was encircled. In fact, the linen trade of the British Isles has run a close race with that of cotton during the last 50 years, and it was mainly owing to the abundance and cheapness with which the latter could be raised in the Southern States that it finally succeeded in establishing its pre-eminence, especially in long cloths, in the markets of the world. When the blockade of the Southern ports, then, stopped the main supplies of the raw material, public attention began to be directed towards flax, and our agriculturists were urged to grow flax, as a substitute for cotton, as it was supposed, and truly so, that the war might last many years, and that our manufacturers and East Indian cotton might not be able to adjust themselves to one another for some time to come. The war still continues, and in all probability will last for years. Cotton, it is true, arrives in considerable quantities from the East, and from other parts of the globe, and our manufacturers are doing their best to adapt their machinery to the staple which they have to manipulate; but in the meantime it may be inquired what are our agriculturists doing in order to promote the cultivation of flax, which, be it observed, when extended, may help to obviate the deficit in the supply of the other commodity? We fear not much. Things go on pretty much in the old way. As long as beef, mutton, wheat, barley, butter, and the usual products of a farm fetch a fair price, our agriculturists pursue the even tenor of their way, and never imagine that prices can alter. In this delusion, however, they may be mistaken. Wheat is now from 5s. to 6s. a bushel; there is a promise of an abundant harvest not only in Great

Britain, but also throughout the world, and in all probability wheat will fetch but a moderate price for some years to come. Would it not be a judicious step, then, on the part of the British farmer, to advance a trifle beyond the usual stereotyped system of cropping, and grow, say an acre of flax to every fifty of his holding? This crop is not an exhausting one, as many persons ignorantly suppose. It is sown about the latter end of April or 1st of May, and is ready to pull before any white crop is fit for the sickle; and as seeds are sown with it, they always prove unusually heavy next season. The seed of the flax, when saved, which it ought to be, is exceedingly valuable for feeding stock, either by itself or in the shape of oilcake; and when our agriculturists consider the thousands of pounds annually which they expend in purchasing this commodity, the seed of which is for the most part grown abroad, the question must naturally present itself to their minds whether they could not themselves grow this plant on their own land; which, apart from its valuable fibre as the foundation of linen, is one of the most efficient means, in the shape of oilcake, for fattening sheep and bullocks. Almost any land in England, with the exception of a stiff retentive clay, will grow flax; it occupies the ground a shorter time than any white; it pays well, and we are decidedly of opinion that more attention ought to be devoted to flax than has hitherto been, not only in a national point of view, but also with respect to the individual interests of the agriculturists themselves. The crop, in fact, has only to be known to be thoroughly appreciated. In Dorset, Somerset, Norfolk, and in certain portions of Yorkshire, flax is grown in small quantities. In Ulster it is more generally cultivated, but the great consumers of flax and hemp throughout the three kingdoms are obliged to import the chief bulk of their supplies from the North of Europe; and it certainly does seem strange that Russians, Belgians, and Poles should be able to grow, manage, save the seed of, and dress flax better than Englishmen, and in addition furnish them with that cake which costs so much, as well as adds to the weight of their sheep and bullocks. We certainly think that the time has come when our agriculturists might, with profit to themselves and advantage to the nation, set about preparing their land for sowing next spring a moderate breadth of flax-seed, and we have little doubt that continued experience will induce them to persevere in their efforts.—*Post*.

REARING CALVES ON MILK AND LINSEED MEAL.

When a calf is first dropped it is covered with a thick slime which Dame Nature teaches the cow by instinct to cleanse by licking it off; and if she shows any disinclination, the country people, to induce her to do so, sprinkle it with a little salt and fine oatmeal. This is necessary for the calf's comfort, cleanliness, and health, and is thought by many usefully medicinal to the cow, and on every account should be encouraged. If the calf is permitted to suck the cow it will be more difficult to make it take its meals from the pail, and also fret and annoy the cow, which will not give its milk freely, but retain it for its offspring. But though it will be necessary to prevent the calf sucking its dam for these reasons, it should be fed on the cow's first milk or breastings, which Nature designs as its most nutritious food; it is also medicinal, cleansing the bowels of the pent-up meconium or fecal matter secreted there during its confinement in the womb. It should, therefore, get a sufficient portion of this naturally medicinal aliment four times a day, say a pint and a half at a time, so as not to keep it fasting too long, and, at the same time, not to overload the stomach. The calf should get a portion of its own dam's milk as long as it retains its peculiar medicinal quality, which may be known by its coagulating upon being heated or boiled; but older calves should not get any of it, as to them it would be injurious.

When the calf is a week old, a little skim milk may be gradually mixed with the new milk, and after a fortnight, a little fine oatmeal, Indian, bean, pea, or linseed meal mangle may be added gradually, which will enable the industrious and economical housewife to save her milk for the production of butter or cheese, and rear her calves also.

No doubt but the best and most proper food for the calf is its own dam's milk; for it is a true food, in which the components of nutrition are so nicely balanced by the all-wise and beneficent Creator, as to set at nought all human compositions;

but it is of so much value for human consumption that it becomes necessary to economise it and make imitations of it, though at a very humble distance; and thus it is that science comes to our aid. Professor Johnston says, in his "Lectures on Agricultural Chemistry," "that while the calf is young, during the first two or three weeks, its bones and muscles chiefly grow. It requires the materials of these, therefore, more than fat, and hence half the milk it gets at first may be skimmed, and a little bean meal may be mixed with it, to add more of the casein or curd, out of which the muscles are formed. The costive effects of the bean meal are to be guarded against by occasional medicine, if required. In the next stage more fat is necessary, and in the third week, at latest, full milk should be given, and more milk than the mother supplies, if the calf requires it; or, instead of the cream, a less costly kind of fat may be used. Oil-cake finely crushed, or linseed meal, or even linseed oil, may supply at a cheap rate the fat which, in the form of cream, sells for much money; and instead of additional milk, bean meal in large quantity may be tried, and if cautiously and skilfully used, the best effects on the size of the calf and the firmness of the veal may be anticipated."

This scientific note from Professor Johnston has engaged the attention of many stock masters in Ireland, and, amongst the rest, Mr. C. Beamish, of Cork, who adopted it and brought it to a regular system on an extensive scale. His formula for compounding the mucklage is as follows:—Thirty quarts of boiling water are poured on three quarts of linseed meal and four quarts of bean meal. It is then covered up close; and in 24 hours added to 31 quarts of boiling water, then on the fire, pouring it in slowly, and stirring it constantly to prevent lumps, with a perforated wooden paddle, so as to produce perfect incorporation. After boiling 30 minutes, the prepared mucklage or gruel is put by for use, and should be given blood or lukewarm to the calves, mixing it in small quantities at first with the milk, say one-fourth mucklage with three-fourths milk, progressively increasing it, so that by the end of a fortnight it will be in equal parts; by the end of the third week, one-and-a-half mucklage to one part milk; by the end of the fourth week the mucklage may be given in double the quantity of milk, and skim milk substituted for new milk; and by the end of the sixth week, the mucklage will be gradually increased in the proportion of two-and-a-half to one of milk, and from that out till the tenth week the milk may be gradually reduced, so that by that time they may be fed wholly on mucklage till they are fifteen or sixteen weeks old, when they may be weaned.

During all this time, if too early in the season to put out the calves, they should be comfortably housed, well ventilated, and kept perfectly sweet and clean, with a little sweet hay tied in bundles, and suspended so that they may play with it, and learn to nibble and eat it, and a little pounded chalk, mixed with salt, given in troughs to lick at pleasure, which prevents acidity in the stomach, and the undue formation of curd; small lumps of linseed cake should also be given in other troughs, which they will soon learn to suck, if a little peas are taken to put a bit in their mouths after they have taken their meal of milk and mucklage. When housed it will be advisable to have a separate pen for each calf, of sufficient size to walk about in, to prevent them getting into the habit of sucking each other, and swallowing the hair, which, uniting with the curd, by the regurgitating process going on in the stomach, forms round balls, which are indigestible, and which is the fertile cause of the death of many promising animals. The following scale of quantity of milk, or milk and mucklage combined, for each calf, may be useful, but should be altered according to circumstances: For the first week the calf may get from 3 to 4 quarts daily; for the second week, 4 to 5 quarts; the third and fourth weeks, 5 to 7 quarts; fifth and sixth weeks, 8 to 10 quarts; six to eight weeks, 10 to 12 quarts per day, and so on, increasing the quantity about 1 quart per week per calf till weaning time, dividing the above quantities equally, and feeding the calves four times a day.

Some parties do not give so much liquid food per day, but make it up by giving them finely cut roots, dry oatmeal, &c.; but the animals are much too young for such food, though they may get the minced roots, so as to train them into their use. Hay tea is an admirable thing also to mix with the mucklage and milk, as it contains a large amount of nutriment in a soluble form.

In the summer time the calves may be left out on the grass, both day and night, in a fortnight after they are calved, and fed as already described they should be in the house; but a warm, sheltered paddock should be provided for them, and in wet weather they should have access to a covered shed.—*Irish Farmers' Gazette*.

PEST OF THE FARM ROOT CROPS.

SIR,—In the summer of 1852 I was struck with astonishment, on visiting a field of Swedish turnips (which, four days before, had been covered with an even plant some six inches high), to find not a trace of vegetation of any kind, but a glaring white surface of chalk and flint. Upon crossing a broad green turf road, about sixty feet wide, I found about two acres of a field of rape gone in a similar manner. The destroyers evidently consumed the rape in line, for the outside of the standing crop, which was about twenty-four inches high, was perfectly straight the whole way across the field. Upon examination, no trace of any kind of caterpillar could be found either among the rape or in the ground at its foot. Upon visiting the crop at mid-night, however, it was found covered with the caterpillars of the common dart-moth (*Agrotis segetum*), the noise of whose feeding resembled the sound caused by a heavy shower of rain. On the following morning, upon search being again made in the ground, nothing, for a space of five feet wide, could be seen of them; but, upon searching six feet from the standing crop, fifty could be found upon each square foot two inches below the surface. I then ploughed a trench (and afterwards excavated the chalk below) all round them, and at night, as they crossed this trench on their way to the feeding ground, poured upon them sulphuric acid and water. The few that escaped I caused to be collected by hand, paying tenpence a-pint for them. Since that year one or two may occasionally have been seen upon the farm. This year they have again appeared, and, having utterly destroyed four acres of a beautiful field of white carrots, are now busily endeavouring to destroy an adjoining one of twenty-three acres of mangel wurzel; but I am employing an army of boys to pick them out and boil them.

In recently crossing one of the mangel fields belonging to a neighbour, I found half his crop gone already, and, of course, informed him of what was going on. As they once caused nearly a famine in Germany, necessitating the calling out of the soldiers to collect them, and as it appears that their ravages are not confined to my own crops, I have thought it right to put my brother agriculturists upon their guard. The following description is from *Morton's Cyclopædia of Agriculture*, under the heading, "Surface Grubs."

"They are, most of them, as large as a goose quill when full grown—an inch or two long—tough, smooth, and shining. Those produced from the eggs of the common dart-moth sometimes commit sad devastation in turnip and young mangel wurzel fields. They are also very destructive in the corn field. They are in existence all the year, and in some seasons are abundant and full-grown from the beginning of June till the approach of winter. In summer they will often eat off the crowns of the turnips, and in autumn groups of them are found eating holes in the bulbs, just at the surface. In the garden they clear off the cabbage tribes and lettuces with astonishing rapidity by eating through the taproot a little below the surface; and at night they come forth and draw the detached leaves into their burrows. As soon as a plant droops, if the earth be carefully removed, the surface grub will be found, two or three inches below, and about the same distance from the root; but, if left for a night, the culprit comes forth, travels with great speed to a neighbouring plant to accomplish the same mischief, and thus, in a short period, one caterpillar will destroy several plants."

I may add that every mangel here had at least one or two grubs eating it, and some had as many as thirty; that their ravages first make themselves known by the under-leaves turning yellow and falling off; and that these pests will eat entirely through the taproot of a mangel or swede whose bulb is six or seven inches in diameter.

I am, Sir, yours,
FREDERICK F. HALLETT.
The Manor House, Brighton, Aug. 18th.

AGRICULTURAL STATISTICS, IRELAND. 1863.

RETURN, SHOWING, IN STATUTE ACRES, THE EXTENT UNDER FLAX IN EACH COUNTY IN 1862 AND 1863, COMPILED FROM RETURNS OBTAINED BY THE CONSTABULARY, WHO ACT AS ENUMERATORS.

COUNTIES AND PROVINCES.	Extent of Land under Flax.		Difference between 1862 and 1863.	
	1862.	1863.	Increase.	Decrease.
ULSTER.				
	Acres.	Acres.	Acres.	Acres.
Antrim.....	13020	21548	8528	—
Armagh.....	16204	24036	7832	—
Cavan.....	6150	10279	4129	—
Donegal.....	19489	24089	4600	—
Down.....	30532	44970	14438	—
Fermanagh.....	2273	4479	2206	—
Londonderry.....	19698	25868	6170	—
Monaghan.....	14289	20051	5762	—
Tyrosse.....	24834	31995	7161	—
Total of Ulster..	146489	207345	Increase 60856.	
MUNSTER.				
	Acres.	Acres.	Acres.	Acres.
Clare.....	441	586	145	—
Cork.....	291	662	371	—
Kerry.....	259	380	121	—
Limerick.....	73	190	117	—
Tipperary.....	197	327	130	—
Waterford.....	13	38	25	—
Total of Munster..	1274	2183	Increase 909.	
LEINSTER.				
	Acres.	Acres.	Acres.	Acres.
Carlow.....	3	12	9	—
Dublin.....	1	1	—	—
Kildare.....	1	6	5	—
Kilkenny.....	19	51	32	—
King's.....	162	337	175	—
Longford.....	192	406	214	—
Louth.....	181	704	523	—
Meath.....	139	324	185	—
Queen's.....	37	63	26	—
Westmeath.....	68	158	90	—
Wexford.....	18	33	15	—
Wicklow.....	—	4	4	—
Total of Leinster..	821	2099	Increase 1278.	
CONNAUGHT.				
	Acres.	Acres.	Acres.	Acres.
Galway.....	138	299	161	—
Leitrim.....	529	888	359	—
Mayo.....	455	695	240	—
Roscommon.....	173	327	154	—
Sligo.....	191	256	65	—
Total of Connaught	1486	2465	Increase 979.	

	1862.	1863.
Total acreage under flax in Ireland ..	150070	214092
Total increase	—	64022

Extent of Flax grown in Ireland in each of the following years:

	Acres.		Acres.
1854	151403	1859	138282
1855	97075	1860	128595
1856	106311	1861	147957
1857	97721	1862	150070
1858	91646	1863	214092

*. The foregoing return—which exhibits an increase of the area under flax in every county except Dublin—is published, as in previous years, in anticipation of the general

abstracts, which will show the acreage under the various crops, and the number of live stock, by counties and provinces; they will, I trust, be ready for publication in the course of the ensuing month.

I do not apprehend that any difference of importance will be found between the acreage under flax here given, and that which will appear in the detailed tables now in course of compilation.

WILLIAM DONNELLY,
Registrar-General.

Agricultural and Emigration Statistics Office,
5, Henrietta-street, Dublin,
14th August, 1863.

WAR AGAINST THE THISTLES.

CAN THE GROWTH AND SEEDING OF THE FLOATING SEEDS OF WEEDS NOT BE PRE- VENTED BY LAW?

Last year we alluded to the very objectionable practice which exists in many parts of the country of allowing weeds to run to seed, to the great detriment of the country at large, and more especially to the neighbouring farmers. As yet, no notice has been taken of the nuisance in any quarter that we are aware of with a view of bringing the question more prominently forward; so we have every excuse for again alluding to the subject, in the hopes that some member of the Legislature may obtain some protection for farmers against their "weedy neighbours." We allude more especially to weeds growing by themselves, either in permanent grass or in grass under rotation; those growing in corn are sometimes difficult to get removed without injury to the crop, and such at times will get the better of the most skilled agriculturist. The road trustees are in some cases to blame as far as roads go, but we believe there already exist compulsory measures for the cutting down of such weeds on the public roadsides. In the course of a recent journey we found instances where millions of tall thistles are just about to blossom, and send their seeds to be carried by the winds to and fro all over the land. This is the case in almost every county; but at this time we shall only instance Gullane Common, in East Lothian, as an example of the evil; and really the neighbours, who are not reckoned bad farmers either, must be exceedingly forbearing, for there you may see dozens of acres of enormous thistles in the state alluded to. This common must supply seed for many counties. The entire range of the bents of the east coast, with some small exceptions, is well calculated to poison the fields of the adjoining agriculturists. When farmers' clubs are looking for subjects of discussion, why not take up this? It is surely one that affects their pockets yearly to a considerable degree, as we may judge from the quantities of thistles seen in almost every field of grain. If a little agitation were set to work upon the subject, Parliament would certainly consent to a bill being brought in compelling thistle-growers who allowed such weeds to grow to seed to cut them immediately down, otherwise providing that, if that is not done, the work will be carried out at their expense. One of our colonies gives us a precedent for such a law, and why cannot the same be carried out in the mother country? In the introduction of such a measure, all weeds which disseminate their seeds by means of the wind should be included. Objections may be raised to interference with private rights and privileges, but we can see quite as much harm in allowing thistles to seed as in grasping a cow by the roadside, or letting a dog follow a cart, all of which are punishable offences. At the present time there is no weed which is giving the agriculturist greater trouble and expense, there being hardly any method of extirpating them except the costly one of pulling by hand. The smallest piece of root left in the ground will take hold at once, and the roots of these have been found at a depth of 10 feet. There is no weed, too, which we think looks worse, whether in corn or in grass; and when in the former, what accidents at harvest time and what delays have we not seen! What a sorry annual for a bare-armed female reaper! what a job for the hands of the unfortunate binder, not to speak of the mill-feeder! Were farmers united on this matter, and spoke boldly their demands, a deaf ear could not be turned to them by the powers that be.—*Scottish Farmer.*

STEAM CULTURE MECHANICS.

The next steam plough—taking them in the order of time in which they appeared in the field—that demands our notice is the invention of Fowler and Greig. This is the implement to which the attractive trade name of “balance-plough” was first applied. It is now known as “Fowler’s Steam Plough”; but the real inventor of the *see-saw* movement, that which has procured for it the above designation is Mr. David Greig, farmer, son of the late Mr. David Greig, Harveston, Kincardineshire, N.B. In questions of this kind, truth is sacred, and we should not be giving a faithful exposition of fact were we to pass it by unrecorded. Since the Chelmsford meeting of the Royal Agricultural Society, Fowler’s steam plough has undergone many improvements. In principle, however, it remains the same, and consists of a bent lever frame, carrying two sets of ploughs, one on each side of the fulcrum; upon which it turns, the leverage being thus of the first kind. In Fiskin’s implement, the corresponding beams of the two sets of ploughs were united by intermediate gearing; but in the example now under notice, the two sets of ploughs—the one having right-hand turnovers, and the other left-hand turnovers—are fixed upon a common beam frame, the several beams being so fixed together as to form a bent lever-frame as above, which vibrates on a central axis as its fulcrum—not unlike, when out of action upon the headland, to that of the beam of a common balance or steam engine. It is this similarity to the movement of the beam of the common balance that has procured for the machine the popular name of “the balance plough.” But, like many other hastily-formed popular notions, it is a very erroneous and improper distinctive appellation; for all ploughs are balance-ploughs, and none of the steam ploughs or horse ploughs now in the field exemplifies so imperfect a balance or state of equilibrium when in action as Fowler’s balance steam-plough. This Mr. Fowler acknowledges himself in a second patent (Fowler and Morley), for he there specifies that the down set of ploughs in action requires a counterpoise to counterpoise the counterpoise of the opposite set (P) —i. e., the down set requires to be hauled down!—which unquestionably involves a doctrine by no means consistent with the theory of the balance. A beam vibrating on a central axis does not constitute a balance, for it has only one point of suspension, whereas three points of suspension form an essential characteristic of the common balance. M’Rae’s steam plough had a vibratory motion on a central axis, viz., the axle of the principal wheels, more especially on the headland; so has a common cart, hand-truck, and many other machines, which might just with as much truth have been termed balance machines, for this reason, as Fowler’s steam plough. Moreover, it is contrary to the mechanical economy of the balance for the two arms of the beam to touch the counter alternately, the scales and goods weighed preventing this; so that the two ends of the beams preserve a nearly horizontal position, having very little play.

The alternate up-and-down movement of the two sets of ploughs in Fowler’s implement is that exemplified in two boys playing at “see-saw” on a beam or plank over the axle of a pair of old cart-wheels, or anything nearest at hand that will serve for a fulcrum. In this familiar pastime of childhood, it requires an effort from the down-boy’s inferior extremities to effect a continuous up-and-down motion, so as to keep the game alive. And just so is it with Fowler’s two sets of ploughs; for when once

one set is down, it requires something more than the mere counterpoise action of the opposite set to make them play at “see-saw” over their fulcrum. We do not say so in condemnation of Fowler’s steam plough, but the contrary; for were the beam frame so constructed as to preserve the horizontal position and sensibility of the beam of the common balance, it would be ten-fold more objectionable than it is at present. In other words, the “see-saw principle” is less objectionable than the “balance principle,” because the sacrifice of gravity or of the weight of the ploughs at the ingoing and along the field, so essentially necessary to economy of motive power and to sound mechanical principles generally, is less in the former than in the latter.

This peculiar “see-saw” movement is similar to the counterpoise action of Fiskin’s implement, noticed in a previous article, but more objectionable in character, owing to the greater sacrifice or misplacement of gravity; in other words, because the counterpoise is greater; it is therefore a mechanical defect, and can only be treated as such. To examine it in any other light would be to prostitute steam-culture mechanics to purposes far below the dignity of so elevated a branch of applied science. In other words, those who are now lauding this pseudo-balance principle are friends to neither Mr. Fowler nor the steam plough. On the contrary, we point out faults and short-comings purposely, that they may be mended.

Before noticing the deviations made in Mr. Fowler’s steam plough from the sound mechanical principles exemplified in M’Rae’s implement, manufactured at Glasgow, and tried in the neighbourhood of that highly-enterprising city in April, 1840, let us first examine how far the two ploughs agree in mechanism, in order to be able to prosecute inquiry more successfully and stimulate the cause of progress.

It has already been shown that M’Rae’s steam plough consisted of a carriage frame, borne by two large central wheels—the one a furrow wheel and the other a land wheel, with two lesser land wheels—the one a guide wheel in front, and the other behind, partly for controlling the depth of the furrow and partly for giving dynamical stability to the carriage and implements in action; and that this frame carried a right-hand set and a left-hand set of ploughs for alternate turnwrest action—in principle similar to what has since been adopted by Mr. Halkett in his “Guide Railway System.” And if those of our readers who saw this plough in operation on the lands of Possil in 1840, and who also saw Mr. Fowler’s at work at Chelmsford in 1856, will make the comparison, they will find many points of close similarity between the two implements, more especially as regards the working parts in action, upon which successful practice in each case depends. Thus, after both are entered at the headland, we find in each example the two principal carriage wheels—the one in the furrow, and the other on the land directly opposite, with a set of ploughs following each other diagonally; the first, or leading one, turning its furrow slice into the open furrow immediately behind the large furrow wheel; the second turning its furrow slice into the open furrow behind the first plough, and so on for the next; a lesser wheel running on the land opposite or behind the last plough. Thus far the parallel is so close, that we a second time specially draw the reader’s attention to the justness of the comparison. Again, following up the inquiry, in the front or forepart of the Chelmsford ex-

ample the leading wheel of the Glasgow machine is removed, and its place occupied by a man—a very clumsy mechanical equivalent, but nevertheless exemplifying similar mechanical data and performing in principle identically the same office, for the ground under the feet of the man in Fowler's plough and under the leading wheel in M'Rae's is in each case the fulcrum, while the handle of the former at the fork, or somewhere about the pelvic region, corresponds to the axle of the latter. In other words, M'Rae's leading wheel and the legs of Fowler's man are both endless levers, the ground being in each case the fulcrum. Moreover, M'Rae's levers for raising his ploughs have a counterpoise action, so that they could be easily weighted at the extremities like a Danish balance, so as entirely to raise them out of the ground at the headland, on sounder mechanical principles than are exemplified in Fliken's or Fowler's implements, were it (the contrary of what it is) any improvement; but being an objection, Mr. M'Rae wisely avoided such a proviso. At the same time the principle of a counterpoise is thus evidently involved, while the one set of M'Rae's ploughs counterpoise the other on the opposite side of the axle of the main wheels—the axle bosses forming the fulcrum—the two sets being in a more perfect state of equilibrium than in Fowler's implement, but entirely free from the objectionable central-action when at work. In point of fact, as regards central-action, when M'Rae's shares strike a stone, his up-ploughs, from being below the fulcrum, have an upward movement, thus counteracting the tendency of the down set to rise out of the ground.

It will thus be seen that there is a closer parallel between M'Rae's steam plough and Fowler's than is perhaps generally credited, even by those who have examined both implements in operation in the field. It must also appear manifest to those who have seen both, and are practically acquainted with ploughing, that if the latter makes good work, the former of necessity must make better, being freer from mechanical imperfections, not only as regards the performance of work at the headlands, but also along the whole length of the field. We repeat this without fear of contradiction; for no one with an unbiassed mind, who has served an apprenticeship in holding the plough, as I have done, can legitimately arrive at the contrary conclusion.

We now come to examine the shortcomings of Fowler's steam plough; and the first deviation from the sound principles of its predecessor (M'Rae's) that calls for notice is the fixing of the several ploughs in each set on the old beam frame plan, so popular about the beginning of the present century, owing to the able advocacy of Lord Somerville and many others, it being considered at that time by them an improvement on horse ploughs. The plan, however, from its many mechanical defects, had but a short-lived popularity; and the greater the number of ploughs in the set, the more objectionable the implement, because the more imperfectly is the work performed at the headland, the third and fourth plough being farther from the "land's-end" than the second. Into the details of this it would be superfluous to enter. Suffice it to say, in conclusion on this point, that, so long as the ploughs are thus rigidly fixed together, just so long must the implement be considered as exemplifying one of those departures from sound mechanical principle that renders it incapable of being improved. In other words, there is but one alternative left for Mr. Fowler, and all who have adopted this plan, viz., to return to the example of the father of the steam plough (M'Rae), as has already been shown in a previous paper. To conclude otherwise would be to betray the cause of progress.

The next false move that claims attention is the welding, as it were, of the two beam frames together, so as to form only one, with a set of ploughs on each side the central

axis or fulcrum, over which they now "play at see-saw." As this is the peculiar characteristic that distinguishes Fowler's plough from Fliken's, it will be necessary to examine the working of the former from headland to headland, as we did the working of the latter, in order to see how far they differ.

At the ingoing, Fowler's down-set of ploughs require, as has already been stated, a counterpoise to counterpoise the counterpoise of the up-set; and this is necessary, not only at the entry, but along the whole length of the field. This is effected partly by the imperfect counterpoise action of the up-set, or, more correctly speaking, owing to the centre of gravity of the whole implement falling behind the ground fulcrum on which the two principal wheels act, partly by the weight of the ploughman seated towards the extremity of the down leverage, and partly by the hauling-down and hauling-up action of the rope (?).

As to the first of these, the centre of gravity, much will depend upon the levelness of the land. Thus in going down a steep incline, it would evidently fall before the ground fulcrage of the wheels. It is this that makes railway carriages, waggons, and other bodies go down-hill at an accelerated velocity of their own accord. Its effect upon the dynamical stability of Fowler's steam plough is therefore manifest, especially if the land is full of stones, or consists of a summer-baked tenacious clay, splitting before the shares; for in both those cases there is, of necessity, a very narrow limit to the angle of depression at which the implement will work successfully. What the measure of this angle may be has not yet been ascertained by experimental investigation of any value either to science or practice.

In Fliken's example the centre of gravity falls between the two pair of carriage wheels—these forming two fulcra, so that in going down-hill his working ploughs do not tilt out of action.

Of the gravitating action of the ploughman nothing almost requires to be said. More, we aver, might have been made of his weight than has been done, so as to save the rope, either by lengthening the leverage at which it acts, or by a combination of levers, as exemplified in the steelyard.

The down-hauling action of the rope is more subject to criticism, as it increases draught, and consequently the tear-and-wear of the rope. The extra draught, too, is not the worst feature in the objection, for the see-saw movement of the ploughs have a drawback break-rope action when the shares of the down-set strike a stone, that is not very easily estimated as to the effect produced. This break-rope action is all the more objectionable, inasmuch as it might easily have been obviated in one of several ways.

This hauling-down process is, like the "see-saw" movement which occasions it, an objection—a mechanical defect that ought to be avoided, in order to reduce the draught of the rope to the minimum standard. So far as the catenary or weight of the rope is involved, it cannot be done altogether, as this weight must be borne, just as the draught bar and traces have to be kept from the ground in the case of the horse plough. This will readily be granted by all who have served an apprenticeship, and learned to walk erect between the stilts with the least counterpoise action on the handles and fulcrum under the heel of the implement; but just so must it be granted that the less the weight of the whippetree bears upon the beam the less the hauling-down action and counterpoise, and consequently the less the strain upon the traces. The dynamometer has settled this question practically, in the case of the wheel-plough *versus* the swing-plough, as was shown under the horse-plough; and the obvious conclusion at which we arrive in the case of the steam-plough under consideration is, that the same scientific rationale must be

reduced to practice to lessen the draught upon the rope; and this is even more a matter of economy in the case of steam-power than horse-power, owing to the greater variation in the length of the traces of the steam-horse, and consequent diversity in the angle of draught as compared with his old rival. The details of this were shown under the conveyance of force by the rope (No. VI., to which we refer back for particulars), the pulley of the rope porter or barrel of the winding drum or endless rope drum, as the case may be, corresponding to the shoulder of the horse, and the point to which the rope is yoked to the draught-pin of the ropes.

It is manifest from the drawings that accompany M'Rae's specification, that his steam plough when borne on four wheels between the two sets of implements is subject to this objection. The mechanical defect is small as compared with that of Fowler's; but it nevertheless exists in too conspicuous a manner to be denied by the warmest admirers and patrons of the Glasgow implement; for whenever the traction rope is yoked to a point below the axle of the carriage-wheels, as it is evidently shown to be in the drawing above referred to, then the force thus applied acts upon a lever or beam resting on two points as fulcrum, and consequently of necessity must haul down at an angle exactly similar to what is exemplified in Fowler's problem, the difference between the two being merely a difference in the measure of the angle, so far as the principle of hauling down is in the abstract involved. It is also evident from the diameter of Pinjus's wheels, that he must have hauled down his carriage under his "roping system," as we shall subsequently see Howard does; although he does not show the point to which he yokes his rope. Mr. Hasnam, of Burcott Park, had recourse to two subsidiary carriages, one at each end of his implement, to obviate the hauling down objection. Heathcoat had rollers, and all who have carried out the heel-to-heel position of the ploughs have had to adopt similar mechanical equivalents. Moreover, M'Rae hauled down his carriage-frame and down set of ploughs, both by his hauling rope and slack rope passing over the guide-pulleys under the frame, as shown in his patent.

It is but justice, however, to the father of the steam-plough to notice, that in the reduction of his problem to practice he obviated the hauling down objection to which we have just referred. This he did by the adoption of a lower guide-wheel in front, thereby bringing the several points to which the traction force is applied more nearly in a line, so as to harmonise with the vertical angle of draught, and thus reduce resultant action and the tear-and-wear upon the rope to a minimum. This cannot be wholly done, owing to the variation in the angle at which the rope pulls ahead of the point to which it is yoked to the implement; but back-draught break-rope action and resultant forces adverse to progression and the least resistance of the furrow-slice may be obviated, and the variation in the angle reduced to an approximate mean between its two extremes.

The peculiar characteristic of Fowler's plan is, that he yokes his rope to his plough-frame at a point behind his carriage-wheels, so as to involve the back draught break-rope action, and not to the carriage frame in front, as in M'Rae's example, and that in the hauling down his plough frame and ploughs his ropes at the same time haul up his carriage frame, in such a manner that the more the rope pulls down, the more it hauls up. There is doubtless something very anomalous in the antagonistic purposes to which the rope is thus applied, and something tenfold more anomalous in the opinative advocacy of pseudo-mechanical writers, who are now teaching the agricultural world that the very salvation of the steam-plough depends upon "cross purposes" of this kind; but it requires

no second sight to account for both, for the moment Fowler's plough enters at the headland, the plain matters of fact speak for themselves—the hauling down and up processes being manifest to the eye of the observer, from the rope or draught-rod, as the case may be, being passed round the lower part of the carriage frame, and thus having to "pull round a corner," if we may so speak, the direction of the rope thus forming an angle under the implement.

This deviation of the rope from its proper rectilinear position is faulty in more respects than one. In the first place, for example, it gives rise to antagonistic forces as above stated, and resultants that not only increase the resistance to be overcome, but also, at the same time, reduce the force with which such has to be effected; and, in the second place, from the bottom of the carriage frame acting as a fulcrum to the two forces, viz., the tractive force in front and the back draught of the central action behind, when the shares impinge against a stone or any obstruction, the pressure of the rope upon the angle or fulcrum is equal to the sum of both; consequently, the break-rope action is of a twofold kind, longitudinal and lateral. The magnitude of either cannot be accurately estimated, owing to the difficulty of calculating the centrifugal action of the up-ploughs. Much, of course, will depend upon the velocity at which the implement is moving, the levelness and hardness of the land, and the nature of the obstruction experienced before the shares. But whatever the magnitude of the tilting action may be, and the consequent back draught, it is something considerable; for we have seen the ploughman tossed up so that you could see daylight between him and his seat. The mere fact of a counterpoise being applied sufficient to prevent the ploughs rising out of the ground, does not annihilate the back draught break-rope action, but the contrary, for the greater the force applied to one side of the fulcrum, just so much the greater must be that on the other to counterbalance it, and, consequently, the greater the longitudinal and lateral action on the fulcrum. The momentum of the up-ploughs resembles that of a fly-wheel, or the weighted arms of a coining press; and as there is a fly-wheel at the engine, the rope is thus placed between two accumulated forces, both of which it has to sustain upon the fulcrum in question. The momentum of the latter is no doubt reduced before it reaches the under part of the carriage frame, as indicated by the catenary of the rope, so that the farther from the engine the less the harm; but this, at the best, is but a poor apology for the mechanical defects under consideration.

Again, the yoking of the rope or "draught-rods" to the plough frame behind the wheels involves another mechanical defect as compared with M'Rae's plan, inasmuch as it sacrifices the dynamical stability or steady-going of the implement. In other words, it involves the old familiar story of putting the cart before the horses. It gives rise to another system of adverse forces, as exemplified in the amount of steering required to guide the wheels, which also must increase the resistance, and consequently the draught of the rope, however well the work of steering may be performed. And this defect is the less excusable, seeing it might have easily been avoided, granting that the see-saw movement was, what it is not, a step in the right direction.

There is thus a wide parallel between Fiskien's and Fowler's implements at the in-going and in moving along the field, although a certain amount of counterpoise is involved in both examples. The former could have easily worked his winch by steam power, both at the in-going and out-going, while the latter could with not much more ingenuity have adopted the screw and sector; and had they done so, the comparison would not have been so far asunder. As it is, there is a very material difference between the mechanical equivalents which they have adopted

at the in-going to effect identically in principle the same purpose, both examples showing, when compared with M'Rae's, a humbling departure from the beautiful simplicity of sound principles, where parts, purposes, and effects produced, harmonise and even invite as it were further progress in the same direction.

We have next to examine Mr. Fowler's steam plough at the out-going. Having noticed how it is entered at the one headland, and actuated along the length of the field to the opposite end of the ploughed land, we have now to investigate the *modus operandi* of raising it out of action, hauling it on to the headland, and taking on fresh ground.

In following up this inquiry, we have first to demand the reader's attention to a process in the out-going of Fowler's steam plough common to the previous examples of M'Rae's and Fiskien's implements, viz., the raising of the furrow-wheel out of the furrow on to the headland, which relieves the turnovers of the pressure of the furrow alices, while it at the same time raises the down-set of shares half out of the ground.

In the former example (Fowler's), however, something more than the half-up process is effected. As the furrow-wheel, for example, begins to ascend the short incline out of the furrow on to the headland, the windlass at the same time is thrown out of action, while the ploughman jumps off his seat and the hauling-down process ceases. The immediate effect of these changes is the relieving of the counterpoise, and the bringing into play the see-saw movement—the momentum of the up-set of ploughs from their central action on the axis on which they vibrate raising the down-set wholly out of the ground. As it is in the old proverb, "He gaineth by another's losses" ("Ex incommotis ulterius sua comparat commoda"), so it is with Fowler's steam plough, for at the outgoing it gains some of the heavy losses sustained at the ingoing, and the ploughman takes the advantage of the inertia of the whole machine and the momentum of the up-ploughs in more ways than one; for by checking the onward progression of the near wheel, and giving a slight pull to the rising frame, he not only makes it raise the down-set, but assist in preventing the shares of the up-set from getting entangled with the rope, in the turning round of the implement, so as to take on fresh ground. But for this momentum of the up-ploughs, it would take a greater expenditure of muscular power on the part of the ploughman to raise the down-set than what is expended in raising M'Rae's ploughs individually the short distance necessary in his case; and this, we may observe, is a result not unfrequently realised when the implement is first put into the hands of unexperienced workmen, the ploughmen thus having to pay an apprentice-fee.

Under the immediate superintendence of Mr. Fowler's own well-trained staff mishaps of this kind are seldom or ever observable; indeed they are no doubt carefully avoided, as much perhaps for commercial reasons as artistic. The timing of the several manipulations at the headlands, such as signalling, throwing the windlass out of action, controlling the implement as already stated, and again starting on the reverse movement, have like all other manipulations in art, where the hands of the workman are called upon to co-operate with steam-going machinery, to be acquired by experience, skill, and perseverance. The former (experience) is of itself insufficient; for, in accordance with the old maxim under horse-power, "A bad ploughman never gets a good plough," and its contrary, "A good hand makes good work with any plough." So will it be found under steam; but that is no reason why the artistic merits of the ploughman should be mistaken for the mechanical defects of the plough, or *vice versa*. Just now too little attention is being paid to the importance of this old and long-established maxim, especially in its applicability to steam-ploughing.

The rigidly fixing of the ploughs, so as to rise with the furrow-wheel at the headland half out of action, is another mechanical defect to which the reader's attention must be turned—one that is common to each of the above three implements, M'Rae's, Fiskien's, and Fowler's. In horse-culture, when the furrow-horse steps up on to the headland out of the furrow, the plough has a tendency to rise; from the change that takes place in the angle of the draught; but this the ploughman prevents, by a skilful movement and pressure on the handles. This increase in the angle of draught he anticipates, and indeed feels, the moment the first foot of the furrow-horse rises on to the headland, and therefore makes an immediate effort to prevent the share rising along with the force. This he does purposely, to avoid the making of bad work, which would be the inevitable result were he to neglect the professional duty thus devolving upon him. And as it is at the headland in horse-culture, so ought it to be in steam-culture: mechanical provision should be made for lowering the ploughs, so as to preserve an equal depth of tillage close up to the headland, a provision which could easily be made in M'Rae's implement, and which no doubt will one day be effected.

At the "out-goings" Mr. Fowler's steam-plough makes worse work than at the "in-goings." This arises from the mechanical defect noticed in the preceding paragraph, which is less objectionable when the furrow-wheel goes down into the furrow than when it rises up out of it. In both cases bad work is made, apart from what is due to the ploughs being fixed in a frame on the Somerville plan; but between the two there is a difference in favour of what is performed at the in-going. From the furrow-wheel being in advance of the leading plough, it reaches the bottom of the descent, or nearly so, before the first share leaves the headland, and begins to enter, so that the ploughs enter without being actuated under any deviation in the angle of draught, generally speaking. At the out-going, however, it is otherwise; for, as the furrow-wheel is in advance of the leading share, as above stated, it consequently follows that the ploughs begin to rise and make badwork the moment the furrow-wheel begins to rise; so that there is a distance between the two inclined planes—the descent and ascent—equal to the distance the furrow-wheel runs in advance. And this the reader will perceive is in favour of the in-going set, as to the more uniform depth of the furrow alices closer up to the headland, than those of the out-going ploughs.

Between Fowler's implement and Fiskien's there is a considerable difference as to the effect produced by the wheels at the "land's end"—a difference which is in favour of the former at the in-going but the latter at the out-going. A carriage on two central wheels is also more easily managed in taking on fresh ground. In other respects, as to the quality of the work performed at the headlands, under equally skilful superintendence, the difference between the two is unworthy of a special notice, so far as effected by the wheels, both being alike subject to condemnation. Under horse culture, no farmer of any experience and skill would tolerate, for example, the work made by either, for half a yoking. If a man undertook to work a team, and could make no better ploughing at the in-goings and out-goings than is now being made by Fiskien's and Fowler's steam ploughs, he would, we repeat, be dismissed without ceremony or regret. Does Practice with Science under steam power sanction any other rule of guidance in ploughing at the headland? To this only one answer can be given, as formerly stated, viz., What has from time immemorial been condemned in the case of horse culture cannot be approved of under steam, and must unquestionably at no distant date, or as soon as steam ploughs are made on M'Rae's plan, experience a similar verdict at the hands of intelligent agriculturists. As to

novelty in the number and position of the wheels, there is none in either, both being close copies of M'Rae's two plans, as shown in a previous article. Between the headlands or along the land, Fiaken's implement is comparatively free from the objection of tilting; so that, as far as the mere act of ploughing is involved it is the best of the two steam ploughs. But, unfortunately, no provision is made for hauling it with a windlass. This, however, could easily be done.

The practical solution of the in-going and out-going problem is, doubtless, no secondary one in the construction of steam ploughs. That the work of ploughing the furrow slices of uniform depth close up to the headland can be better done under steam power than horse power is manifest from the fact that the former is a more uniform and rectilinear system of draught than the latter, and much more under the control of the workmen. The contrary conclusion therefore can only be received as an apology from those who have failed in effecting a practical solution of this important steam-culture problem. We have seen that M'Rae did not solve it satisfactorily, although he was much nearer it than any of his successors. In point of fact, both Fiaken's and Fowler's implements exemplify mechanical defects of a character which prove beyond controversy that both are a long way astray out of the "march of improvement," and that so long as their respective inventions proceed in this direction the farther will they find themselves from the winning-post; consequently, if they are determined thus to move on in defiance of successful practice and sound mechanical principles, the pioneers of progress have but one alternative left them, viz., to take up M'Rae's plans, which are now public property, and thus lead the steam horse to victory and triumph. As one connected with Glasgow in 1840, we cannot for a moment think that the enterprising capital of the West will sell her birthright for a mess of pottage; we have already vouched our professional credit for the contrary.

Of the steam ploughs on our list, two remain for examination, viz., Chandler and Oliver's, and Howard's. From their close similarity to each other, and to Fiaken's in principle, we shall be able to notice both in this paper.

Chandler and Oliver's implement consists of a right-hand and a left-hand set of framed ploughs, in principle not unlike the plan patented by Mr. Pinkus in 1840, already referred to, but connected together by intermediate gearing, so as to have a see-saw movement similar to Fiaken's. Like the next example, Howard's, its mechanism perhaps more resembles the early construction of ploughs exemplified by the Messrs. Fiaken in Scotland than the Carlisle one covered by their patent of 1855, to which our notice in a former paper was confined. But into minute details of this kind it will be unnecessary to enter, as both are a long way inferior in point of mechanical merit to M'Rae's implement, owing to the several ploughs in each set being rigidly fixed in a frame, and to their being inseparably connected together by intermediate gearing as above. The patentees hold several patents which show no lack of ingenuity; and the pity obviously is that this ingenuity has been diverted from the proper course by the popularity of Fiaken's and Fowler's. This we prognosticated in 1855 and 1856, when the see-saw movement appeared at Carlisle and Chelmsford, and for which we experienced at the time no little contumely; but many, who then repudiated our apprehensions as groundless, now find, to their experience, that sound mechanical principles cannot be long superseded by the popular but passing expediency of the moment. We do not say so in reproof of our old opponents, but the contrary, our object being to enlist, if possible, their mechanical talents, and those of Chandler and Oliver, in the improvement of M'Rae's steam plough on sound principles, so as to reduce the tear and wear upon the rope to a

minimum, and make better ploughing than they now do at the headland. They admit, in one of their circulars before us, that they have "had great experience in wire-ropes, and find that the success of steam cultivation depends entirely on the ropes." Such being their own conclusion—one to which we readily subscribe as sound—it is to be hoped they will perceive that the public, for whom we write, have a claim upon their services in the cause of progress.

The peculiar characteristics in this steam plough, that principally claim our attention, are the carriage and wheels, the intermediate gearing, and the mode of yoking the rope, including its counterpoise or hauling-down action, as compared with the previous examples.

In their first patent (No. 1232, A.D. 1858), the carriage frame is borne on three wheels, a furrow-wheel and two land-wheels, similar to Alexander Francis Campbell's (No. 12,668, A.D. 1849); but in a subsequent patent of the same year (2,420), they propose two large central wheels like M'Rae's Glasgow plough.

Two land-wheels and a furrow-wheel on the opposite side, half-way between, is faulty in more respects than one. In the first place, for example, the dynamical equilibrium of their basis or ground fulcrage is not satisfactory. Statically considered, as at the headland resting on three bearings, one on the one side and two on the opposite do not present anything very objectionable to the stability of the two sets of ploughs; but it is otherwise the moment the one set is lowered into action, the other set raised an extra stage higher above the surface of the land, and both hauled at a rapid pace along the land, especially if the soil is full of stones, or a tenacious clay baked in the summer sun; for then the tilting action of the up-set of ploughs has a tendency to throw the implement over the bearings of the furrow-wheel and the leading land-wheel diagonally on to the ploughed land, and to make the down-set in action roll upon their turnovers similar to what is experienced when the furrow-horse steps out of the furrow on to the ploughed land, leading the land-horse with him. And, what is more, this diagonal tilt is not only produced by the shares coming against stones, or other obstruction below the surface, but also when the second or hindmost land-wheel passes over small stones or clods upon the surface. In the second place, the resistance of the two land-wheels is greater than that of the furrow-wheel on the opposite side, so that the equilibrium of draught is defective. And, in the third place, wheels thus situated are more difficult to steer. Now, in each of these cases the draught upon the rope is not only increased, but rendered more irregular—the latter being attended perhaps with a greater amount of tear and wear than the former.

The second plan, of two large central wheels, whether with a small land-wheel behind on the plough-frame or not, is therefore a decided improvement as regards the dynamical stability of the carriage, and steady action of the ploughs in operation.

As to the intermediate gearing that connects the two sets of ploughs, the peculiar novelty that distinguishes it from that of Fiaken's implement is the working of two vertical draught or cope-bars alternately up and down, by means of a small pinion between them—the pinion being actuated by a winch, and gearing into the rack or teeth of the vertical bars. These vertical bars carry toward their lower ends the two draught axes, or draught bars, for hauling the ploughs, so that the fulcrum is moveable, the fulcrum in each case having a vertical motion up or down as the case may be. The merits of this part of the intermediate gearing call for special notice, and therefore we shall return to it, as it is applicable to the lowering and raising of single ploughs on M'Rae's plan. The mechanism of the suspension-bars and connecting-rods at the upper end of the vertical-bars, for raising the ploughs

behind, is defective, as it involves a prodigal waste of force, and tear and wear of working parts. No doubt the several parts perform their respective works, but the power that actuates them is not so economically applied as it might have been. In this it somewhat resembles Fiskien's slotted lever and connecting-rods. Happily, although the leverage is very complicated, it is chiefly of the second kind, so that the extra length of the second and third plough-beams is not so objectionable. But what it gains in this respect it loses in another, as we shall see under counterpoise action.

Returning to the lowering and raising of the point of the beams by means of a vertically moving draught-pin, as promised—this has long been considered a cardinal question in the construction of the steam-plough; and, therefore, we have the greater pleasure in drawing the reader's special attention to Chandler and Oliver's mode of solving the problem. The principle involved in their mechanism, if applied to single ploughs, is far superior to what Pinkus proposed in his two patents, while it is free from some of the objections to the short-beam plans of M'Rae's and Fiskien's ploughs. Pinkus raised the point of his beam and draught-pin, for example, by means of a vertical screw, as formerly shown; but the process of lowering or raising is too slow for the requirements of practice; for granting that the threads of the screw were an inch asunder, it would take six turns of the winch handle to raise the draught-pin of the copse six inches. Now, as the weight thus raised could easily have been effected directly by the hand of the ploughman, the application of the screw involves a prodigal waste of muscular power. Chandler and Oliver may easily obviate this waste; but into the details of mechanical improvements it is not our province to enter: indeed, such would hardly be "*fair play*." On the contrary, our duty is to point out faults, that the parties themselves may mend them. In other words, as formerly expressed, we hope Chandler and Oliver will improve their own plan of lowering and raising their ploughs, as hinted above.

Of the mode of yoking the rope and hauling down the ploughs in action, so as to counterpoise the weight of the elevated set, it would be superfluous to repeat what has already been said, as both are liable to the objections formerly mentioned in Fowler's and Fiskien's examples. There are, no doubt, some slight differences; but these are too manifest to require a descriptive notice, seeing that Chandler and Oliver's steam-plough is in operation in the field, and generally known. The counterpoise is more active, or in other words, less counteracted by friction of leverage than in Fiskien's case, and hence more objectionable, but more counteracted than in Fowler's, and therefore less faulty in its mechanism.

The Bedford steam-plough (Howard's) is also constructed on the "see-saw principle," the two sets of ploughs being connected together by intermediate gearing. With the exception of the carriage and wheels, it is freer from complicated mechanism than either Fiskien's or Chandler and Oliver's, which it closely resembles in its general character, and therefore it has fewer mechanical defects. It is also free from the back-draught break-rope action and hauling down of the ploughs at work. Such being a rough outline of the implement, we shall examine it under the three heads of carriage and wheels including steerage, the intermediate gearing, and yoking of the rope, in comparison with the previous example.

The carriage frame, like that of M'Rae's, is suspended below the plane of the axis of the wheels upon which it is borne; and the wheels are three in number, their position being similar to Mr. Campbell's, and the last example. From the centre or middle of the carriage frame a vertical lever-bar arises, common to both sets of ploughs, and serving identically the same purpose as the

vertical lever-bars of the Glasgow implement, as will be shown under the head of "intermediate gearing." Another peculiarity in the mechanism of the framing is the situation of the axis or draught bars of the two sets of beams at opposite ends, *i. e.*, the beams of the down-ploughs in operation behind have their draught-pin or bar in the fore-part of the carriage frame, while the beams of the up-ploughs have theirs in the back part of the carriage frame, so that the beams work between each other, crossing each other's planes when being raised out of and lowered into action.

The position of the wheels is objectionable, as shown under last example. But the crossing of the plough beams involves a movement in the right direction—one, too, that is favourable to the adoption of two central wheels on M'Rae's plan. With single ploughs, however, there is no novelty in the crossing of the beams of the two sets, as it has often been proposed and carried out into practice in Halkett's railway system.

The peculiar novelty of Howard's intermediate gearing is the making of the one plough frame a compound hand-lever for raising or lowering the opposite frame of ploughs, as the case may be, by means of connecting or suspension chains, and eccentrics on the top of the vertical lever-bars, already noticed, rising from the middle part of the framing of the carriage. The mechanism of these several parts is too well known to require a detailed description. At the ingoing when leaving the headland the ploughman raises the front ploughs the extra height required according to the "see-saw principle," by applying the muscular power of his arms to the extremity of the back plough frame, so as to bring the ploughs into action, and, on this being done, by jumping into his seat, when his weight thus applied keeps the ploughs in the ground. In thus being applied, the muscular force and weight of the ploughman have two advantages of leverage—the one from the longer axis of the eccentrics, and the other from the centre of gravity of the opposite ploughs being at a less distance from the fulcrum. In this combination the reader cannot fail to perceive a very beautiful economy of time, space, and force, very different from what is exemplified in the intermediate gearing of Fiskien's, and Chandler and Oliver's implements. A winch is not a profitable plan of applying muscular force, especially when the weight has to be raised at a rapid velocity, as in the case in question. In this respect Fiskien's mechanical equivalents are faulty in the extreme, when compared with either M'Rae's or Howard's. Between the latter two, the Glasgow and Bedford ploughs, the mechanical equivalents form a very close parallel, owing to M'Rae using, at the top of his vertical lever-bars, a sort of compound spring lever bow for raising and lowering his ploughs; but, between the two, the simplicity of mechanism and the economy of time, space, and power are greatly in favour of the former (M'Rae's steam-plough) both at the ingoing and outgoing. At the outgoing Howard's down-ploughs may either be lifted up by applying the muscular force to the extremity of the down-plough frame, or by being pulled down from the opposite side, and, in either case, the eccentrics exemplify what may be termed "the gaining or winning point," when the leverage turns in favour of the force thus applied; moreover, the central action of the up-ploughs harmonizes with the muscular force thus applied. Along the field Howard's implement is, however, inferior to Fiskien's in several points; for in the latter the ploughman at the winch can not only counteract central force when the share comes against a stone, but make the resultant of that force aid in overcoming the extra resistance thus experienced, while he can also prevent the pulling up of the down ploughs by the counterpoise of the opposite set, as experienced in the former. No doubt the Messrs. Howard could easily counteract the

pulling up of the ploughs at work by locking the elevated set, so as to throw one or both connecting chains slack, and thus leave the down set free to gravitate without any counterpoise, similar in principle to what the Messrs. Fiskien accomplish by their screw and sector, as formerly shown; and we believe something of this kind is in progress at the Britannia Iron Works; but up to this date it has not, to the best of our information, been publicly exemplified, so that it does not fall within the province of our present notice.*

Howard's plan of yoking the rope is similar to M'Rae's, and not unlike that of Fiskien's when the implement is hauled to and fro between two windlasses, actuated on opposite headlands by the light hempen rope of the rigger system—the two ends of the two winding drum ropes being attached to the opposite ends of the carriage frame, instead of to the middle part of the opposite plough frames, as in the examples of Fowler, and Chandler and Oliver. Howard's ploughs are therefore hauled by the coope pin or fulcrum bar, as are M'Rae's, Pinkus's, and the unpated examples of Fiskien's when thus actuated, whatever may be the point of the framing to which the rope is yoked.

The parallel between the corresponding parts or mechanical equivalents of the Bedford plough, when compared with the Glasgow implement (involved in the yoking and action of the rope), is very close—more especially in reference to M'Rae's four-wheel plan, as shown in his specification drawing, where it is evidently intended that the three down-ploughs in action shall have a freedom of vertical play apart from the carriage frame. In other words, the carriage frame is hauled down, but not the plough-beams and ploughs. In this respect there is a slight difference between M'Rae's two plans—the ploughs in the Glasgow example being when

in operation rigidly fixed to the framing, but not hauled down, or, more correctly speaking, not prevented from rising out of the ground by the action of the rope, but by the weight of the carriage, the change in the position of wheels obviating the mechanical defect of hauling down by means of the rope. Howard thus hauls down his carriage frame, but pulls up his ploughs, as shown in the previous paragraph. The hauling of the ploughs by the coope pin or fulcrum bars is sound; but the hauling up and hauling down processes are mechanical defects that require to be obviated, if such have not been effected already.

In these several respects, as regards the yoking and action of the rope, there is a wide contrast between Fowler's and Howard's plans. Thus, the rope in the former (Fowler's) case hauls down the ploughs but up the carriage frame; whereas, in the latter (Howard's case), it hauls down the carriage frame while the ploughs, in action are hauled up by the counterpoise of the opposite set. These are practical conclusions, susceptible of a ready proof experimentally in the field, so that it is not easy to divine how professional men should have fallen into the popular error that Howard's ploughs are hauled down, seeing they are actually being pulled up; for before ever the draught bar of the Bedford ploughs could be hauled down the one eighth-part of an inch, the framing must be either bent or torn asunder. And what renders this popular error all the more anomalous and humbling, is the fact that those who have fallen into it also blame the Howards for copying Fowler's plan of pulling up his ploughs at work by the counterpoise of the opposite set, seeing that the pulling up and hauling down processes involve mechanical defects or departures from the march of improvement, exemplified in the Glasgow case—popular errors and departures, of which both parties have ample reason to be ashamed.

ENGINEER.

AVERAGE DIRECTION OF THE WIND.

The prevalence, during otherwise very seasonable weather, of the east and north-east wind in the month of May, rendering the days remarkably chilly and the nights even frosty, caused attention to be turned to the consideration whether such a wind was usual in May, and, generally, how the winds on the average are divided throughout the several seasons of the year. A few minutes devoted to a little inquiry into the matter of winds, and their average direction and duration, will be neither uninteresting nor unprofitable.

We have frequently pointed out in these pages, whilst treating of other meteorological processes, that all phenomena of this kind have certain periods of recurrence, to be determined by a longer or shorter term of observation, as the exigencies of the case seem to demand. For the sake of example, to prove that the temperature of the day is greater than that of the night we should only require thermometrical observations extending over any four-and-twenty hours of normal character. But, on the other hand, if it were required to exhibit the gradual daily march of temperature from the coldest day of winter to the hottest of summer, no single year would be sufficient, but we should require a very large number of years—indeed a less number than fifty would be hardly available for the purpose, and very many more would greatly enhance the value of the result.

Now, from the extreme variability of the wind, as regards direction, it becomes an important object to obtain as many years' observations as possible, and they must be of the most careful and perfect character. Unfortunately we do not possess these desiderata to the same extent as we could wish, although every year now adds to the amount of information which we require.

It will be manifest to our readers that where so variable an element as the wind is the subject of investigation, the observations must be of a full and continuous character. Hitherto the direction of the wind has been observed, as the temperature and pressure of the air, only three or four times during the day; while no account was taken of the variations between these times of observation, and none whatever of the prevailing direction during the hours of the night. In the case of the thermometer and barometer, the four daily variations are sufficient for all ordinary purposes, and will furnish, after the proper reduction, and application of corrections for diurnal range, readings very closely approximating to the true mean value of the entire day. But this is not the case with the wind; before we can deduce any certain information as to the average duration of the winds from different quarters throughout the year, and their distribution over the several months and seasons, it is essential that we should possess the records of a self-registering anemometer, and that extending through a long period.

As these instruments are of comparatively recent date, meteorologists has considerably suffered in consequence, and we frequently hear the most contradictory statements

* Since the above was written the new Bedford steam plough has been successfully reduced to practice. It is free from several of the objections of the old one.—E.

made in relation to the Seasonableness of certain winds. It is to be regretted, moreover, that even the loose method of observation, by looking occasionally at the vane, is not unfrequently utterly useless, from the fact of its not turning freely in its socket, or a still more mischievous error arises from the cardinal points being out of their proper direction. We have seen many vanes where they have been placed a whole handful of degrees out. As so much depends, in judging of the weather, upon the directions of the wind, those failings on the part of the vane are really much to be deplored.

The correctness of the cardinal points of old vanes, or the correct placing of new ones, may be easily effected in the following simple manner: Place a straight thin rod in the ground in some convenient spot, and on a bright day observe when the length of its shadow is least, which will occur, of course, at that time when the sun is at the meridian of the place; then if we draw a line along the shadow we shall obtain the north and south points. The east and west will, of course, lie in a line bisecting this at right angles.

The want of continuous observations has not only misled the amateur, but in standard meteorological works of a few years ago we find very erroneous opinions upon the average direction and duration. We shall therefore give our readers the results as deduced from an Oster's self-registering anemometer, an instrument that records night and day every vagary of that inconstant element; and as they are computed from upwards of twenty years' records, they may be relied upon as being very near the true mean values.

In the following table we give the average number of days (as determined from a period of upwards of twenty years) that each wind prevails in the different months of the year; in this table we have referred the direction to eight points of the azimuthal circle, and have given the results to days only, omitting fractions, which would only tend to make the statement less clear, whilst it would add but little to the value of the practical information to be gathered from it. The number of days on which there was so little motion as to render it impossible to define the direction are given in the last column.

Month.	Average number of days on which the wind blew from the							
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
January.....	8	8	1	2	4	10	8	1
February.....	8	4	2	1	3	8	8	2
March.....	4	4	3	2	3	6	8	2
April.....	4	6	3	2	3	8	8	2
May.....	4	7	2	2	2	8	4	2
June.....	3	4	2	2	3	10	4	2
July.....	3	4	2	1	3	11	4	2
August.....	3	3	1	1	2	7	3	2
September.....	4	3	2	2	2	9	2	2
October.....	4	2	1	2	3	8	2	2
November.....	3	2	2	2	3	8	4	2
December.....	3	2	2	2	3	10	4	2
Sums.....	41	48	22	21	34	106	39	22
								34

From this table we gather the following facts:— The north wind is least prevalent in the winter and autumn months, and most prevalent during the months of March, April, and May. The north-east wind is least prevalent in October and December, and is most so in the months of April and May. The east wind is least frequent in January and the autumn months, and most prevalent in March and April. The south-east wind, the least frequent in this country of any, is pretty equally divided over the year. January has the greatest number for the south wind, and April, June, and September the least. The most prevalent wind of these islands, the south-west, is least frequent in April, and most so in July. The west wind is least frequent in May and November, and is most prevalent in the months of June, July, August, October, and November. The north-west wind is least frequent in January, May, and September, and is most so in March.

We also learn from the same table that calm days are least frequent in April, the average number being only one, and are of most frequent occurrence in the months of September, October, and December.

The sums of the vertical columns show the proportion of each wind during the year. It seems to be sufficiently in detail for every purpose to give the direction, as we have done, referred to eight points of the circle; and might even be of sufficient practical value if resolved to the four cardinal points only; though we should infinitely prefer in all cases that the eight points should be used, as giving a truer idea than would be inferred from four points only. This is especially the case with us, as a divergence of half the quadrant will give us a wind of a very different meteorological character. If we resolve the numbers given above to the cardinal points, the result will stand thus:—

Months.	North.	East.	South.	West.
January	5	3	10	9
February	6	5	8	9
March	7	6	7	8
April.....	8	8	7	7
May.....	8	7	7	6
June.....	6	5	8	10
July.....	6	3	8	10
August.....	5	3	9	10
September	7	5	6	7
October.....	5	3	9	10
November.....	7	5	8	7
December.....	5	4	9	10
Sums	75	57	96	103

By the above method it will be seen that we lose one of the most striking features of the former table, the great preponderance of the south-west wind, which in this table is divided by the south and west.

It will be observed that the south-west direction is in every month greater than any other, and in some months is as much as three times the next most prevalent wind.

The south-east wind, as has been already observed, is the least excepting in January, when, it appears, the east wind is the least prevalent.

WOOL IN THE UNITED STATES.

The condition of the woollen manufacture of the United States is a matter of interest to our farmers, because the production of wool there does not keep pace with the demand, and hence large purchases have to be made here and on the Continent. The climate of America renders woollen clothing necessary throughout a large part of the Union during much of the year.

According to the census of 1840 there were in the United States 19,800,000 sheep; of 1850, 21,733,000 one year old, or older. The present number of sheep in the Union, exclusive of lambs, may be estimated at 26,000,000.

The consumption of domestic wool in 1840 was returned at a value of 11½ million dollars, and of foreign at under one million dollars; in 1860, the home-grown wool used was returned at 28 million dollars, and the foreign at four million dollars. The value of the woollen manufactures used there was in 1840, 80,000,000 dollars, and in 1860, 96,500,000: of these last sums 69,000,000 dollars was of home manufacture.

The progress of the trade in foreign wool and woollens is shown by the following figures of the value of imports into the States:

	Wool.	Woollen Goods.
1840	£169,200	 £1,814,240
1850	336,340	 3,430,800
1860	1,000,000	 6,704,200

The quantity of wool returned for the whole Union in 1850 was upwards of 52½ million pounds. Sheep raising has been greatly extended and improved since that date, in Ohio, Texas, California, and other States, and the clip in 1860 amounted to 60,511,843 pounds, an increase of 15.2 per cent. in ten years. The yield still falls short of the consumption, and large quantities continue to be imported, notwithstanding the amount of territory adapted to sheep husbandry. Let us see what quantities of wool have been shipped of late years from the United Kingdom to the United States:

	British. Lbs.	Foreign & Colonial. Lbs.
1860	1,205,307	 1,635,893
1861	4,084,289	 6,005,658
1862	3,903,340	 7,719,886

Thus there was a total shipment of 11,623,226 lbs. of wool across the Atlantic in 1862.

The number of sheep exported from the States has never been large. The highest number reached was about 20,000 in 1841, and now it averages about 8,000 or 4,000 annually. Of wool a few hundred pounds only are usually exported. In 1845 668,000 lbs. were shipped, and in later years but 300,000 lbs. or 300,000 lbs. annually; but in 1861 we received over 1,000,000 lbs. from the United States.

To show the importance of our trade in woollens to the United States, we may state that while in 1857 our shipments of woollen manufactures there only amounted to £1,675,000; in 1858 they were £2,700,000; in 1859, £4,502,600; in 1860, £4,100,000; and although in the last two years they have dropped to half this amount, this decrease arises more from the war than from any increase in their home manufactures.

The last census returns enable us to trace the advance in American manufacturing industry in this branch. The value of woollen and mixed goods made in 1850 was £9,060,000; in 1860 it amounted to £17,777,200. The factories numbered 1,909; of which 453 were in New England, 748 in the Middle, 479 in the Western, two in the Pacific, and 227 in the Southern States.

The aggregate capital invested in the business was £7,100,000, and it employed 28,780 males and 20,120 females, 639,700 spindles and 16,075 looms, which worked up more than eighty million pounds of wool, the value of which, with other raw materials, was £8,100,000. The foregoing figures include mixed fabrics, of which the warp is cotton, though usually classed with woollens. The largest amount of woollens was made in New England, where the capital was nearly £4,000,000, and the value of the product about £7,700,000, nearly as much as the total American manufacture in 1850. More than half the capital, and nearly one-half the product of New England belonged to Massachusetts, which had 181 factories of large size. Rhode Island ranked next, and had increased its manufacture 163 per cent. in ten years, that of Massachusetts being 48 per cent. The value of woollens produced in the middle States was £5,000,000, in the Western States £745,000, and the Pacific and Southern £504,000. The sectional increase was in New England 52, in the Middle States 54, and in the South 107; the last showing the greatest relative increase. Pennsylvania, next to Massachusetts, was the largest producer, having 447 factories which produced £2,550,000 worth of woollen and mixed fabrics—an increase of 120 per cent. A value of £1,800,000 was the product of 222 establishments in the city of Philadelphia.

The State of New York holds the third rank in relation to this industry, its manufactories amounting to nearly £2,000,000. The woollen manufactures of Maryland exhibit an increase of 86 per cent. In Ohio, which produced in 1850 a greater value of woollens than all the other Western States, there was a decrease on the product of 1850, owing, probably, to the shipments of wool to Europe, which in 1857 was found to be the most profitable disposition of the rapidly increasing wool crops of that State. In Kentucky, now the largest manufacturer of wool in the west, the product was £226,000, and the increase in the ten years 40½ per cent.; while in Indiana, which ranks next, it was 81 per cent., and in Missouri 19 per cent., on the production of 1850.

These statistical details are interesting for study and comparison by our wool producers and manufacturers, as they serve to show the ratio of progress of woollen manufactures in the States. Their oppressive tariff may probably stimulate home production; but with all their extent of country, and suitability of climate for sheep-farming, and the active demand for woollens for home consumption, it will be long before the Americans can equal us either as breeders or manufacturers. The value of the exports of British woollens rose between 1850 and 1860 from £10,000,000 to £26,000,000, and it is assumed by some of our most experienced merchants that the home consumption of woollens is equal to three-fourths of the entire manufacture. Even taking it at as much as that annually exported, this gives us an aggregate value of £32,000,000 for woollens.

THE TIPTREE GATHERING.

The gathering at Tiptree, on the 30th, was not of the usual character. It was disappointing, and probably never would have taken place, had it not been that a school was to be built, and a sum of money collected. The object being good, one could not find fault with the means adopted to attain it, though I certainly consider that the Bazaar would not have fared worse had there been no Agricultural Gathering, and that the Gathering would have been more edifying and pleasant had there been no Bazaar. The two things did not harmonize, and the worthy Alderman who wished to be everywhere, lost so much force by diffusion as to be virtually nowhere.

Still, the weather was charming, and the prospect of "a day out," having drawn many visitors from the metropolis, the attendance under the marquee was large. Beneath the canvas the pop of the champagne bottle and the clatter of ice glasses mingled with the ringing voices of the fair vendors pressing their wares upon gentlemen who were expected to pay towards the future education of the rustics of Tiptree for every freedom of speech or glance, proclaimed the doing of an immense amount of business. Beyond this temporary abode of the Graces, the ebon seductions of Aunt Sally were charming the shilling from the pockets of the young men from town, and other games were devised to induce the circulation of the coin of the realm. Those who went expecting a good dinner were what is popularly termed "sold," for a shilling was demanded for entrance to the grounds, and half-a-crown for admission to the cold collation. Everybody was very good-natured about it, and was disposed to look with leniency on this mode of trading with his popularity adopted in so good a cause by the master of the ceremonies. It was generally considered that the end justified the means, and we shall be glad to know that the receipts of the two days are sufficient to cover the expenses of the new building.

No one can fail to be pleased with a visit to Tiptree; especially if it be made under the chaperonage of the owner thereof. He is so genial and frank a man, and has such a voluble way of conveying information about his own proceedings. The worst of it was, on Thursday, that no one could get a guide over the farm except the bailiff, who would persist in going at the rate of five miles an hour, and resembled more the fox pursued by the hounds than a person deputed to satisfy inquirers. For the portly pace was killing, and, unless a sly move was made to head the bailiff by those who had some knowledge of the country, there was little chance of their finding out anything about the previous course of cropping, &c. Occasionally some little coterie of earnest agriculturists issued through the precincts of Vanity Fair, carrying with them the worthy Alderman, who, by way of distinction, wore a bunch of pedigree wheat in his hatband; but again and again he eluded their grasp, and was lost amid the waves of crinoline which inundated the marquee.

Well, at all events, any one was free to go where he liked, to make his own observations, and draw his own conclusions. Here is the farm; here round about it is the heath, out of which it was snatched some 22 years since. One at the present day is growing furze; the other is growing immense crops of grass, clover, wheat, beans, oats, mangolds, and turnips, and produces annually 200lbs. of meat per acre. The one by the investment of nothing is worth nothing; the other, owing to the judicious in-

vestment of a large capital, is, commercially speaking, worth 50s. an acre. There are certainly no cereal or root crops in the neighbourhood to compare with those at Tiptree, and if some of the surrounding farmers produce as much as 20lbs. of meat per acre from their land, it is all they do. And what is the secret of this change?—Efficient drainage, deep tillage, and liquid manure irrigation.

I am not disposed to contend that Mr. Mechi's is now, in all respects, a model farm. In fact, I do not think he has a right to invite people to inspect it as such, until he has moved a little more ahead of the times. For instance, his system of drainage is somewhat antiquated; he is at great expense by horse culture to secure a deep staple; and he yet clings to small stretches as though he lacked faith in drainage, combined with tillage, to lay the land dry. Numbers of the fraternity have outstripped him in this respect, and the only novelty now to be seen at Tiptree is the system of manuring. Even the feeding of cattle on boards has been copied; and while he must give up for a while the credit of being first, he may rest on the reputation gained for having led others to the front. There can be no doubt that Mr. Mechi's exertions have been productive of immense good to this country, and he may well be proud of the part he has played as a promoter of agricultural progress.

The visitors were, of course, conveyed to the immense cauldron, where, with incessant seethe and bubble, the root food of the farm is concocted. Throughout the day solitary individuals might be seen apparently meditating suicide, and a blissful transformation to the cabbage state, over this deep and distasteful abyss. The whole of the manurial matter of the farm passes into this tank, and is then sent flying over the rye-grass wherever it may happen to lie. The farm consists of 170 acres, of which 12 acres are always in rye-grass, and thus treated after each crop is taken off. The clover and permanent rye-grass are all thus irrigated with liquid manure, which is forced through iron pipes, and driven through hose and jet attached at certain places along the mains. Owing to this process, which was shown, the worthy Alderman can talk of three and four tons of rye-grass at a cut, and of several cuts in the year; of several cuts of clover; and two tons at a cut; of splendid crops of a permanent grass; and of unfailing crops of grain and roots after these, in seasons when the farmers around are complaining of utter failure. The effect of irrigation is illustrated by a field of five acres, opposite the drawing-room windows, amongst the rank herbage of which Aunt Sally was suffering reproof for her obstinate attachment to the pipe, as compared with the lawn, which had never been dosed, and looked as drab as a felt hat. The quantity of liquid put on per day amounts to about 60,000 gallons; and whether it is owing to the effect of this, or to the depth to which the land is broken up after its application, I know not, but certain it is that there is hardly a weed to be seen. It is very seldom that one sees so clean a farm. Mr. Mechi attributes this absence of weeds to the sub-soiling process, which goes on in conjunction with the ploughing; six horses being employed in the two operations. The long tap-roots are thoroughly embedded, he says, and the expenses of hoeing and weeding the cereal crops now growing are stated to be in some cases only 1s.—and in no case more than 2s.—per acre.

Although Mr. Mechi's example has been followed in efficient drainage and deep culture, very few men have

had sufficient confidence in irrigation by hose and jet to venture upon an outlay of \$5 an acre to secure its advantages. I cannot but think, however, that the example is as worthy of being followed in this respect, provided only it be done with due caution, as it is in the others. At least one is disposed to think so, judging by appearances.

On some future occasion it may be that our eyes will again be regaled with accounts that shall set this matter at rest, and prove that irrigation, like steam culture, is an improvement that may safely be recommended to such tenant farmers as may have the spirit to enter upon it.

H. R.

PEDIGREE IN WHEAT.

The name of F. F. Hallett, of Brighton, and the fame of his pedigree wheat are extended over the civilized world, and we believe there is no country, where agriculture is practised, into which his wheat has not penetrated, or from which accounts of its success to a greater or less extent have not been volunteered by those who have used it as seed. Still, there are many persons in this country, and even amongst Mr. Hallett's near neighbours, who doubt the truth or the utility of the principle on which his system is founded, namely, the establishment of a "pedigree" or family name in wheat and other vegetable products, analogous to that of the horse, or ox, and other domestic animals of the farm. Mr. Hallett, in one of his papers on the subject, remarks that the same principle is carried out in the practice of the market gardeners and nurserymen, who, if they happen, by accident or skilful crossing, to obtain a more than ordinarily excellent specimen of a plant, take special care both to preserve and perpetuate its good qualities, and to prevent others from benefiting by it. Mr. Hallett reasonably asks the question, "if this system of pedigree holds good, not only amongst the domestic animals of the farm and the race-course, but also with the plants and vegetables of the nursery and the garden, why should we only stop when we come to the cereal plants, which certainly are as capable of improvement and of maintaining their excellences by proper attention as any others?" Acting on this idea, Mr. Hallett has, as is well known, by the selection of the best ear of wheat he could find, and the best and finest-shaped grain in that ear, raised that stock or family of wheat to which he has given the name of "pedigree wheat."

Occupying tracts of land to the extent of six hundred acres, Mr. Hallett has now for some years sown the pedigree wheat on a large scale, and, allowing for the difference in seasons, with uniform success. As there are still many practical men who doubt whether there is anything worthy of imitation in the system, he determined this season to give them an opportunity of judging for themselves, and of either confirming or altering their opinions, by an actual inspection of the results of the system, as exemplified in his own crops. He accordingly sent invitations to some hundred and twenty gentlemen, agriculturists and others, to assemble on his home farm at Brighton Manor-house on Wednesday last, for that purpose. Owing to a variety of circumstances, both of a public and private nature, only about fifty of those summoned were able to accept the invitation; and these having assembled at about one o'clock proceeded to inspect, first of all, the experimental specimens of wheat, barley, and oats in the garden, a portion of which is devoted to the object of raising seed-corn. Here were to be seen species of wheat from all quarters of the globe, and of as widely different characters; some of them, judging from their appearance, suffering from being out of their native soil and climate, but those of English extraction exhibiting extraordinary vigour of growth in the length and strength of the stems and the size and weight of the ears, some of them having fifteen or sixteen sets on each side, and containing from 60 to 80 grains each ear.

Having viewed and received the explanation of these, the company proceeded to the fields of wheat, which presented a more practical, and therefore, to the farmer especially, a more interesting object. There were two or three features in the appearance of the wheat, that forcibly struck us, namely, the extraordinary strength of the stems, which enabled them to withstand the heavy storm of the 31st ult., and maintain their upright position; and the uniform size of the ear, and absence of under-corn. This is the effect of thin seeding, which allows the plant to develop itself in every part. We were as much struck with this circumstance as with anything resulting from the system. In most crops of wheat cultivated in the ordinary way, with a seeding of from two to three bushels per acre, the quantity of under-corn sometimes makes a heavy deduction from the available produce. We counted on one stool 43 ears, all of which were of the same size and, as near as possible, height. Mr. Hallett has made many experiments in the quantity of seed proper to be sown, and has come to the conclusion that, although half a peck would be amply sufficient to seed the ground, yet, to allow for casualties from birds and insects devouring a part, it is advisable to put in three gallons, or one peck and a-half, which is what he sows at the first part of the season, and finds it amply sufficient. If sown later, he increases the quantity.

The soil of Mr. Hallett's home-farm is a thin, sandy loam, of from three to six inches deep, the hilly parts being, of course, the most bare. It overlies the interminable chalk of the Southdowns district, and is never much troubled with surface water. In some of the fields the soil was always considered sterile, and incapable of bearing a crop of wheat until it came into Mr. Hallett's hands, and he has managed so as to obtain five or six quarters of wheat per acre from it. We should say that the present crop bids fair to yield such a produce this season, from a seeding which a farmer of the old school would be frightened to trust to.

Mr. Hallett farms high, and his crops of clover and roots are excellent. One field of clover was under the scythe for the third time this season, and it was nearly knee deep, measuring at least 21 inches. A dairy of from sixty to a hundred cows are kept on the stabulation system, by which abundance of excellent manure is raised; besides this, Mr. H. purchases a considerable quantity of guano and other artificial condensed manure; this, however, is used very sparingly as a top-dressing for wheat, which would otherwise be too stout, if much was put on. The crops of black Tartarian and white Canadian and Australian oats were excellent, and bid fair to yield a heavy produce. The seeding of the first was two bushels, and of the others three bushels per acre, the usual seeding of the district being five and six bushels.

At four o'clock the company assembled in a meadow near the homestead, where, under a spacious marquee, tables were laid for dinner, consisting, with the more solid food, of every delicacy of the season, with abundance of claret and champagne. The long walk up-hill and down-dale had prepared the guests for a vigorous attack on these material comforts, and dish after dish disappeared, their

places being supplied with others, until, the cravings of nature were satisfied. We have not space to follow in the train of loyal and patriotic toasts that were given, and shall confine ourselves to the substance of two speeches, which bore more directly upon the occasion of the meeting.

With the toast, or sentiment, of "Prosperity to Agriculture," was coupled the name of Mr. William Rigden, of Hove, Brighton, the far-famed breeder of Southdown sheep. In responding to this toast, Mr. Rigden remarked, that he had come there that morning with an unfavourable opinion of—in fact, a prejudice against—the system adopted by Mr. Hallett in the cultivation of wheat; but he was happy to acknowledge that what he had seen and heard had led him considerably to modify that opinion, and to think that Mr. Hallett's system was based upon sound principles, and that, whatever might be the opposition he might meet with, his success was great enough to encourage him to persevere. He recollected that when he first exhibited his Southdowns for competition, they were of course rejected, and a friend advised him to hang them round his neck and jump into the sea with them. Yet he lived to beat that very friend who had given him such sapient advice. He had no doubt that Mr. Hallett would also outlive the prejudice at present felt against him, &c., &c. Such was, in substance, the speech of this eminent sheep-breeder; and coming from such a man, it will tell with double force.

The second speech we shall refer to, is that of Mr. Howard Read, who put the question to the worthy host, of what was the produce of his wheat crop last year? In reply to this, Mr. Hallett observed that he should keep far *within* the limits of truth in stating that the maximum of produce last year was six quarters per acre, and the minimum four and a-half quarters per acre; and he would further state the substance of three letters he had received from parties who had purchased and sown the pedigree wheat last season.

"The first case was that of Sir Thomas Leonard, in Essex, who sowed three acres of it last year, and reaped, in the whole, twenty-seven quarters two bushels, or rather more than nine quarters per acre. The second case was that of Colonel Quenton, of Waterford, in Ireland, the cultivator and seller of the Giant Wheat. This gentleman grew, in 1862, sixty-two bushels per acre, weighing 64lbs. per bushel. The third case was that of a gentleman in Yorkshire, who also in 1861 and 1862 grew upwards of sixty bushels per acre from less than one bushel per acre of seed. These three cases, coupled with his own, in so disastrous a year as that of 1862, and from quarters so widely apart, ought to be sufficient to convince any person that there is some good in the system he had pursued."

After a day of unalloyed enjoyment the party broke up about 8 o'clock, and returned to their homes, many of them with more correct views of the "Pedigree Wheat" than they had previously entertained, and with kindly feelings towards their host for his hospitality.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—No one in these days can find any excuse for remaining in ignorance of what his brother-farmers are doing. The railway makes all men neighbours, and the neighbour has but to look over the hedge to see what is going on.

Having a great interest in Mr. Hallett's experiments in the growth of cereals, I took advantage of an invitation to inspect his crops last Wednesday, and was glad to find myself in very excellent company. Several members of the Farmers' Club were there, together with several eminent agriculturists beyond the pale of that fraternity.

As to who was present, and what was done, you will doubtless be officially informed. Leaving all that, I only wish to state my own views of what I consider to be the present state of the "pedigree" question.

Let me first of all say that about the same time last year I visited Mr. Hallett, and subjected his crops to a very close scrutiny. I may also add that I departed, not only thoroughly convinced of the value of the principle he had with so much success applied, but so fully convinced as to have left him an order for one bushel of the selection which I then saw growing, in order that I might test it at home. To the principle I am therefore a convert, and my opinion must be regarded with suspicion. As to the wheat—the "nursery" wheat, I am inclined to stake no portion of my reputation on its identity, simply because it has nothing whatever to do with the question; although several of Mr. Hallett's opponents do, in order to achieve an easy victory, make his system appear to rest upon so unimportant a basis. It must be clear to all who are acquainted with the growth of wheat, that if there is any truth in selection, as prosecuted by Mr. Hallett, it is as true of one species of wheat as of another, and of barley and oats as it is of wheat. And I must add that I have very little faith in the power of nine-tenths of those who profess to be judges of wheat, to discern different varieties of this grain; for, unless it is selected with care similar to that which Mr. Hallett employs, it never long retains either its purity or its general character.

The second inspection of the crops at Manor Farm set at rest any misgivings I might before have entertained. We were requested to ramble over a considerable breadth of wheat, and could not but come to the conclusion of its vast superiority to anything seen elsewhere. To state the matter shortly, Mr. Hallett seems to begin where wheat-growers leave off. Seldom, in the ordinary crop, will ears be found possessing more than thirteen "ranks." This is what may be termed the maximum, while three and four is the minimum. Now in Mr. Hallett's crops an ear with less than thirteen ranks is scarcely to be found, but ears with fourteen, fifteen, sixteen, seventeen, and in some few cases eighteen, are abundant; so that thirteen may be said to be his minimum, and eighteen his maximum. I need not say that this represents a great increase in the crop. Each additional year's selection appears to add one rank to the ear—at least, this was true up to last year. No instance of an ear with nineteen has been met with, I believe, this year. The crops stand well, and are quite thick enough; the straw is stout and healthy; and everywhere there are signs of a large produce—nothing under five quarters, and a great deal reaching to eight and even nine quarters per acre.

These results are not wholly due to the observance of the conditions laid down by the grower as to the quantity of seed to be sown, the time of sowing, and the mode of sowing. The superiority of selected wheat is conspicuous, though these conditions be all disregarded, and the grain be late sown, thickly sown, and sown with the drill. There are plots bearing the produce of the selection of some particular year, seeded at the rate of from one gallon to two bushels an acre, and sown at various times, from August to November. It will be assuring to many farmers who may desire to grow Pedigree Wheat, to know that its success is not entirely dependent, as is thought, upon putting one grain in a hole, and placing the holes a foot apart each way, or upon dibbling the seed in August or the beginning of September. It is true that perfect ear-development does depend upon perfect root-development; and that, to carry the system to the highest degree of success, early and thin seeding must be adopted. Still, those who cannot get the land ready, or command the necessary labour, may yet derive

great advantages while sticking to the old season and the old drill, by the use of the selected wheat. That which was sown thick and late was far superior to a fine crop hard by upon an adjoining farm, but yet exhibited great degeneracy in point of length of ear. The length of ear was beyond that of the ordinary type (and, let me add, that it takes several years to undo what has been done by selection), but it was much shorter and less prolific than the produce of seeds of the same family to which more time and more space had been given for development. Mr. Hallett has somewhat modified his views as to thin seeding. He now considers three gallons per acre about the proper quantity, and is ready to admit that seasons and locality may even render it necessary to overstep these limits.

It is affirmed that this highly-developed wheat is coarse in the extreme, and fetches but a low price in the market. The study of vegetable and animal physiology does not bring us to this conclusion. It is a coincidence that size and coarseness sometimes go together, but they do not by necessity. It may be the case that some who have tried this wheat have found it wanting in quality; but if there is any value in the principle of selection, it must be admitted that quality as an essential element of character may be transmitted as well as colour, form, and taste. Surely no one will argue that because an oak has free room to grow, its wood is of less value than that of the cramped and contorted forest tree which has struggled hard to break through the gloom into the sunshine; or that the population of a densely-crowded neighbourhood is superior to that of any rural district where limb and lung have fair play! Mr. Hallett's aim has not been to develop a giant variety of wheat, but to bring to its highest and most remunerative state of culture a kind celebrated for its fine quality. It is doubtless the fact that the nursery wheat is not adapted to all climates and soils, and that some who have tried it have been disappointed: but the principle upon which Mr. Hallett builds his system is not, therefore, invalidated. If we deny the value of selection in this case, we must, in very consistency, follow up our repudiation of it by destroying the herd and stud-books, and voting as the utterest humbug all that has been accomplished by virtue of the same in horticulture and floriculture.

The hour spent in the selecting plots was highly valuable; for when the eye was directed to several kinds of wheat growing side by side, marked out by staves, to which were affixed the ears of the several parents, it could not fail to

detect the operation of a general law. A very distinct development was visible in every case.

Mr. Hallett is now giving attention to barley and to oats. It is with the former, however, that he expects to obtain the best results. The greatest number of grains hitherto obtained in England with a single ear of Chevalier barley has been thirty-nine; while, after two processes of selection, Mr. Hallett produces ears with forty-four grains in great number. In this case also his minimum is the maximum of the ordinary grower, and he expects by continued selection to produce the same results as he has with wheat. This question of pedigree is even more important in the case of this grain than in that of any other, and will be, so long as there is a duty of 21s. per quarter upon all barley "wetted" for malting. It is, of course, to the maltster's interest to secure barley of fine, vigorous nature, every grain of which will "grow." He usually finds that from 3 to 30 per cent. of the grains never "grow;" while recent experiments, made in the usual way in a Brighton malthouse, with the Pedigree Chevalier barley, showed that every grain "grew." In fact, neither the wheat nor the barley crops exhibited that large proportion of *tail* corn, which so much reduces the profits of the farmer who is indifferent to selection. However favourable the soil of Manor Farm may be to wheat (a thin staple upon chalk), it is certainly very unfavourable to barley, judging from the experience of neighbouring farmers; and many of them present on this occasion expressed great astonishment to see so fine a crop.

I should have liked to conclude with some remarks concerning produce, but I have already been too long. Suffice it to say that several of the visitors mentioned facts of the most encouraging description; and it seemed to be the general opinion that even should the wheat prove coarser than some other descriptions of the same grain, the increase in bulk would more than compensate for such deficiency. Several instances of eight or nine qrs. per acre were reported, and some cases in which millers purchased it for more than the market price.

Mr. Hallett is carrying on his experiments with great ardour; and as the last was announced as the first in a series of gatherings at Manor Farm, he will next year have something more to show.

I am, Mr. Editor, yours obediently,
SCRUTATOR.

SCOTTISH AGRICULTURAL IMPROVEMENT.

The recent meeting of the Highland and Agricultural Society of Scotland, and the address of its President, furnish a fitting text for some few remarks on the agricultural progress of Scotland, to which that Society has largely contributed, by its long-continued exertions in various directions—its meetings for discussions on agricultural and scientific subjects, its periodical shows, its museum, the publication of its Transactions, and various prize essays, and the labours of its chemical department under the superintendence of an eminent scientific man. The Highland Society, as regards agriculture, is, we believe, the oldest in existence, having been instituted in 1784, its exertions therefore dating more than half a century before the establishment of the Royal Agricultural Society of England. It is 31 years ago since the Society held its periodical show at Kelso, and the general advance in that period has been very considerable. Steam has accomplished great things since then for the country generally, as well as for agriculture in particular. Old hands must have been

astonished at the display of 1,000 implements of various kinds—at the unusually large number of reaping and mowing machines, at traction engines, the cultivation of land by steam, and the various combined powers which the steam engine has effected. Live stock and crops have also improved amazingly; and the Scottish farmer of to-day is a very different man from the farmer of the early part of the century: he has not so much bigotry or self-opinion: he inspects without prejudice new inventions brought forward, and listens with attention to the scientific lectures of the agricultural chemist.

In the words of the noble president and chairman of the society, the Duke of Argyll, agriculture is not merely an industry or an art, but, in the highest sense of the word, a science, and as a science it is to be promoted and cultivated just as other sciences are; and, indeed, the progress of agriculture is even more dependent upon the prosperity of these societies than on the progress of the more purely speculative sciences. If scientific agriculture is

needed anywhere, it is in Scotland, and the advances that have been made testify to its advantageous results. Notwithstanding a large amount of rugged soil, it has a very fine climate for many kinds of agricultural produce. The power which has been given to man of modifying to his own use the animal and vegetable kingdoms, of creating almost, as it were, new species for his own benefit, is one of the greatest mysteries of the world.

To Scotland and the Highland Society we were indebted for the successful prosecution of the labours of agricultural statistics for that part of the kingdom which furnished so much valuable information, and we can only regret that they have been suspended. The value of such statistics, as his Grace well observed, depends very much on their completeness.

Perhaps no country has benefited more than Scotland by the general use of artificial manures. Peruvian guano must always be the most important of these, not merely on account of its intrinsic value, but from the large supply which causes it to regulate the price of all other manures. The farmer, whether he uses it or not, must always watch it with interest, because he feels certain that any cessation of the import would have the effect of enhancing the price of other manures, and more especially of sulphate of ammonia and nitrate of soda, which would rise enormously in price. The direct imports of guano into the Clyde in 1855 and 1856 averaged 10,000 tons; in 1857, 6,100 tons. In 1858 the depreciation of all agricultural produce, together with the high price (£13 10s.), considerably modified the consumption of that manure compared with former years, and increased that of bones and of artificial and less expensive manures. A stock had accumulated at the close of 1858 of 6,000 tons, or double the usual quantity held. In 1859, therefore, the import was only 3,600 tons; in 1860 it touched 12,000 tons, and in 1861 reached the large amount of 18,797 tons—while last year it was nearly 10,000 tons. It is satisfactory to find from the statements recently published that the supply of Peruvian and analogous guanoes is much larger than we were

led to suppose, and that there is at least for a very considerable time no prospect of their being exhausted. Take the words of Professor Anderson, in his lecture to the members, as an example. Few things, as he observes, are more astonishing than the rapid rise of the consumption of artificial manures; and when we hear of millions being annually expended on their purchase, we can scarcely realize the fact that it is little more than twenty years since their use commenced, and that even a dozen years ago it was confined to the most active and energetic farmers, while now it may be safely asserted that there scarcely exists a man who does not use them, or who would be inclined to deny their utility. The best proof of their value is in fact to be found in the rapidity with which they have become an essential and indispensable part of agricultural practice, and the farmer may point to what has occurred with regard to them as a triumphant refutation of his alleged indisposition to go with the times and adopt what is new.

A new source of potash has been recently discovered. The product of the salt called muriate of potash in this country amounted to 7,000 or 8,000 tons, while a work has been recently established in Germany which proposes to make 10,000 tons annually. This great increase in the supply must affect the price of ammonia, and it may prove useful to the farmer in giving him a supply of potash which at no distant date it will probably be necessary for him to apply to the soil. The low prices ruling for nitrate of soda for the last three years have induced its consumption for the purposes of agriculture, for which it has proved a very valuable stimulant. It is now being used for every sort of crop along with guano and other phosphatical manures, and the results, though not lasting beyond one season, have been manifest in a great increase of crop. The direct imports into the Clyde have been about 8,000 tons per annum, besides considerable supplies from Liverpool, the imports into that port having been on a large scale. The production in Chili continues extensive, but present prices remain unremunerative.

THE CLEVELAND SHOW.

Although the alteration in the time of holding this show suited masters of hounds, who under the old régime were tempted to prefer the moors, the unfortunate clashing with Driffield this year told heavily upon the hunter entries. There were 660 entries of all kinds, viz., cattle 51, sheep 44, pigs 11, horses 229, hounds 105, poultry, &c., 61, and implements 109; and the prizes amounted to £850. Redcar was the birthplace of the foxhound portion of the show in 1859, and the return of the society to its seaside fixture found it in its very highest efficiency. Mr. Tom Parrington, the ex-secretary, who originated both the hound show and the £100 prize for blood sires (a plan which for lack of funds the society were unable to carry out a second year), did not bring any of the Hurworth hounds, in consequence of distemper; and the Vale of White Horse entries did not come. Still eleven kennels were represented, and they brought together such a bevy of cracks as even Mr. Percy Williams in all his judicial experience never saw before. Earl Wemyss sent two three-couple lots to endeavour to win the Challenge Cup once more; but Rubicon spoilt his best lot, and the judges Sir Watkin Wynn, M.P., Major Fletcher, Mr. Milbank, and

Mr. Percy Williams, decided unanimously in favour of the beautiful Fife bitches, headed by Bonny Lass and Tempest, which Fred Turpin brought out in tip-top condition. Earl Wemyss was second, and the pair of lemon pies—Larkspur and Lightning, brother and sister—would have brought up the Cheshire at least into the second place, if they had been better supported.

The first prize for puppies was given to Lord Middleton, for his Norah and Prior (the former rubbing off the points against the latter), and the Cheshire, Earl Wemyss and the Cottesmore were placed next in order. For the brood bitch entries it was a hard struggle between Lord Yarborough's Charity and Lord Middleton's Modiah, the former just winning; and Will Smith also took off the stallion hound prize with Gambler, the hound which was placed first at Pontefract three years ago. He is a six-season hunter, and still looks wonderfully well, but is a little weak over the loins. The Cottesmore, which are now hunted by Powell, late first whip to Lord Middleton, had the second prize with Royal. The Yarborough kennel did not show quite such good lots as were expected; their shoulders were hardly the thing, and their

costs not quite up to the mark. A tendency to show them rather too fat also militated against theirs as well as Lord Wemyss's chance, and made the judges a little suspicious. The prizes were given wholly in plate this year, and consisted of a cup and hunting horn; a tankard, goblet, silver-mounted whip, and spurs; a cream jug; a silver pocket flask and 8 sovereigns, and 2 sovereigns, in the four principal classes. There was also a local prize for the best Cleveland puppy reared by farmers or tradesmen, in which Mr. E. Herring got £1 as his reward for the good nurture of Jasper, and Mr. T. Page had Trounce's memory endeared to him by ten shillings! It was a very pleasant sight, and the judges' decisions seemed to be generally acquiesced in, although the Royal v. Gambler question was and always will be a moot question.

The three hunter classes, in each of which 20 sov. and 5 sov. prizes were given, had only 81 entries, and there was hardly so much fun as usual over the jumping. In the four-year-old class, Col. Cotton (who acted for Sir Watkin Wynn) and Mr. Percy Williams gave the prize to Mr. Bruere's black Van Galen gelding, which had been shown and beaten at Boston the day before; and they considered it a very nice one, if not the best in the yard. Mr. Robinson's gelding, with not the nicest head and shoulders in the world, was second to it. The jumping element, which comprised a hedge and a stiff flight of rails, was introduced into the next two classes. Beechwood was leg-weary after winning at Boston the day before, and standing in the show-yard, or in his railway box, with very little cessation for nearly 48 hours, and he did not come. The first prize was given to Mr. John Betty's Vingtum, and the second to Mr. Jewison's First Whip, both of them good jumpers. The judges considered the whole class moderate, with the exception of these two, and by no means equal to the mares, in which class Mr. J. Betty was again first, with his Lady Marceau, a mare of fine quality and substance; and Mr. John Harrison second with his neat little chestnut Topsey, whose mode of doing her fences showed that her steeple-chase experience has not been thrown away upon her. The jumping throughout was very fair, but still the space was not so well adapted to the sport as it was last year, and there was one fence less.

The show of Clevelands was well worthy of the district. Mr. Charles Scurr won the prize for blood mares, with his four-year-old bay, beating Mr. Jonathan Featherston's Stokesley prize mare of the week before. The first for coaching, hunting, draught, and roadster brood mares were awarded respectively to Messrs. Coulson (W. and F.), J. Mewburn, Captain Chaloner, R.N., and J. W. Pease respectively. In the first of these four classes a Stokesley winner was again second. Three out of the four Cleveland foals came to their posts, and all of them by Wonderful Lad. They were first-class, but Mr. John Dodsworth's winner seemed to have a week or two in hand, although he had perhaps hardly such good forelegs as Mr. John Easty's second prize. The prize for the best coaching foal was won by Mr. W. Adameen's, of Marske, and Mr. Farnside and Mr.

Gill furnished the second and the commended in a large and good class. Bondholder's stock were second in the hunting-foal class to Mr. Mewburn's Young Voltigeur colt, and first in the roadster-foal classes. The winning three-year-old and two-year-old Cleveland fillies were both the property of Mr. Ralph Benton, and were excellent specimens of their breed. The former is stinted to Bondholder, and the latter won at Stokesley the week before. Bondholder (twice), Saunterer, Fandango, and Farnham were the sires of the winners in the young hunter classes, and in the four-year-old roadster class the prize fell to an orthodox-bred Prickwillow, dam by Merrylegs, in preference to a fusion of Dr. Sangrado and British Yeoman.

Mr. Booth appeared on the Shorthorn scene with Queen of the Vale, and Graceful (one of his Worcester Royal pair of heifers), and won the first prizes in the open classes for cows and heifers in-calf. "The Queen" looked much below the mark, and had only two middling roans to bear her company. In the yearling heifer class, Mr. Jolly's Lady Leonora won easily, and three by Sir James the Rose, two of them belonging to his noble owner the Earl of Zetland, were commended. His Lordship and Mr. Wiley were commended for their bull in a class which was well headed by Mr. Harrison's Prince Albert, who had been beaten by the Royal bulls at the Durham County, but won this prize last year, and others in the interim. Mr. Pease exhibited a very gallant Shorthorn steer, which stood well on his legs, and was remarkably good across the loins, and in short a dangerous Christmas gladiator, if he goes steadily on, and doesn't chink in his back. The local cattle were not much to speak of, and the sheep comprised Leicesters and black-faces; a ewe pen of the latter, although let down by a "cull," were very useful. Mr. Joseph Simpson gained both the Leicester ram and shearing ram prizes in the open competition; and Mr. Wiley was "on the spot" again with his pen of gimmers, mouldy to a degree, but rather too small, and not quite such "enamelled beauties" as he showed last year. There was a poultry, cheese, butter, and egg show, but the arrangements for it were very slovenly in comparison with former years, and it did not make the appearance it might have done. Having a permanent hall so near, the committee were unfortunately induced to abandon the Guisboro' plan of dining between the hound show and the jumping, which gave the afternoon a zest it never can have when these two salient features are run directly into each other. The catalogues were hardly stitched, and created boundless difficulties, and the bound prize cards were never even put upon the pens; in short, there seemed a general lack of management somewhere, which we have not before observed, and which the committee had better promptly look to, if they wish to retain their prestige. The thirty-first meeting of the Society will be held at Middlesboro' next year, and by way of sealing the bargain, a £100 cheque has been handed in, and £50 more guaranteed. At the dinner in the afternoon, Captain Chaloner took the chair, in the absence of Lord Zetland. The scarlet coats of the huntsman and whips (who had been photographed that afternoon in a half-circle on the hound flags, with Mr. Tom Parrington sitting *in mufi* in the centre), gave nice colour to the party; but alas! the jolly face of poor Tom Sebright, who was here five years ago, was now lacking. The comforts of the splendid new railway inn at Saltburn (which seems like the nucleus of a new Scarborough), five miles farther down the coast, drew some of the principal visitors away; but nearly 200 sat down, and were enabled to hear from the lips of the chairman that the gate receipts were beyond the average of the last ten years, and that the Society could show a clean bill of health.

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

MEETING AT KELSO.

It is just one-and-thirty years since the Highland Society held its first "open meeting" at this bonnie Border town. The passing of a Reform Bill "in another place," or the union of the Teviot and the neutral Tweed might have had their share in suggesting that Belted Will and all the feuds of the foray should be forgotten, and that Booth and Bates might van back the Shorthorns and "the siller" in peace, no William of Deloraine forbidding them. Be that as it may, what once seemed an alarming innovation has long been looked upon as a beneficial change, and many expressed their disappointment that Queen of the Ocean had not come further north than Hexham. The Yorkshire Meeting thinned the Shorthorn ranks, but still the Royal English Agricultural was represented by its first-prize aged bull and cow, and Mr. Wainman brought a whole bevy of Worcester winners into the pig-classes, which would have been shorn of more than half their strength if the English breeders had been barred. In point of uniform quality, it was essentially a Clydesdale year; but as regards numbers, pigs are the only saving clause, when the whole of the live-stock entries are compared with those of Perth in 1861; while implements, on the contrary, have gone up in the proportion of 11 to 8½. Kelso must also be compared with Kelso. When its stock catalogue of '82 stands side by side with the 60-page octavo of this summer, the entries only number 365, as against 983; while to get at the implement increase, you have simply to multiply 11 by 100, and add 1 for luck. It was the intention of the family not to have sent any of the Hamilton Palace entries; but at the earnest solicitation of Mr. Hall Maxwell, who represented most truly how much the Show would have suffered from their absence, and how strongly they would testify to the late Duke's zeal for agricultural improvement, they were allowed to come.

Berwick-upon-Tweed, where the Society met in 1854, and Coldstream were head-quarters for some of the visitors who "had a frugal mind." They very naturally dreaded lest the inn and lodging-house keepers of "Kelsey"—which has been faithful to racing when other Scottish towns have faltered, and will always be memorable in the Weatherby annals as the scene of the dead heat between Lanercost and Beeswing—might have become imbued with the Newmarket and Doncaster leaven, and their fears were not wholly groundless. Luckily for them, the railways kept their time, and carried their cargoes with a regularity and an energy which might put the West Midland to shame, if they have any, and one train specially ran from Kelso to Berwick late on the evening of the banquet-day. The scenery and the high cultivation under no very genial climate, as you approach Kelso from that side, through the Coldstream country, beloved of Lord Wemyss and Will Channing, is singularly striking:

"Deep fields of grain the reaper mows,
In meadows rich the heifer lows,
The falconer and huntsman knows
Its woodlands for the game."

Then, as we wound our way down the pleasant slope, and looked for the first time at the ancient burgh, lying under the very shadow of "the ruined central tower" of St. Mary's Abbey, with Floors Castle amid its deep green setting in the distance, and the Tweed and its latest tributary rolling along past vale and cliff together, we could hardly wonder that the Duke of Argyle should have confessed at the dinner, that now, looking back through the vista of a quarter of a century, he did not remember one foot of the road between Edinburgh and "merry Carlisle," save that view from the Bridge of Kelso. In his boyish rapture he "visited it five or six times that night," and we, too, cherish our latest glimpse of the bridge, as the stately Clydesdales were filing over it from the show-yard into the town, and little Hotspur was caracoling in the centre, as if the memory still stirred him of the days when he stretched the neck of the great Eglinton crack at Epsom, and sent the heart of Scotland into its shoes.

The show ground was by the river's side, and comprised sixteen acres of the Springwood Park, kindly lent to the Society by Sir George Douglas. The Springwood Policy woods sheltered it south and east, trees occasionally broke the uniformity of the shed avenues, and between the Ayrshires and the busy horse-ring they clustered still closer within the low palisades of the ancient burial ground of three parishes, where the grey headstones lay strewn in wild disorder among the rank nettle crop—a cherubim here and cross-bones there. Even without these quaint contributions from "Old Mortality," the show-yard was a remarkable epitome of Scottish progress. Nine acres were devoted to the stock; and the great implement interest, which has grown so surely and so well, occupied seven. The horse-ring—not exactly our grand English oval, but still 140 feet in diameter—was there for the morning and afternoon parade; and not unfrequently a goodly assembly of dukes and masters of hounds stood in the centre, watching the Clydesdales at their long steady trot, and looking out for hunting action with rather slender success among the blood sires and the half-bred geldings. What at first sight seemed to be an observatory, turned out to be a tank with a capacity of several thousand gallons; and Mr. Hall Maxwell had opened such excellent diplomatic relations with the chief magistrate, that the fire-engines of the burgh were placed at his disposal, to enable him to lay this heavy water-tax on the Teviot. The refreshment booth (whose counters and sandwiches might have been larger with advantage) stood in a line with the Society's offices, and beyond them the poultry pens, which proved to sceptical henwives that a noble M.F.H. can take

a delight in breeding foxes and first-prize "Coloured Dorkings" as well.

A committee meeting at four o'clock, and a lecture by Dr. Anderson, of Glasgow, on "Manures, the Sources and Materials from which they are made," constituted the public business of Monday. The show-yard was opened at half-past seven sharp, on Tuesday morning, when the judges were set to work, and the members of the society were admitted by paying five shillings, and the general public twice that amount. The rings were made by roping off the spaces between the sheds, thus leaving the very few who attended two sides for a view; whereas, in consequence of the implement barrier being still up, those who watched the blood-horse judging had only one. A more slow affair we never assisted at, and it was all over by eleven o'clock. We do certainly begin a little too early for members who have to come in from any distance on Monday morning; but if our Scottish friends will have a Monday with Mr. Brandreth Gibbs and the Royal at Newcastle next July, and note that all the members of the Society are admitted *free*, that the cattle wear their numbers in the ring, and that every spectator can buy and read his catalogue without any chance of corrupting the bench—that, in short, the annual re-union round the rings is fast ranking with "the Christmas private view" as a quite red-letter day in our agricultural year—they will not be content with their present deadly-lively system. It was called an experiment, but it was made under conditions which bore failure on their face. In one respect there was an improvement, and a very great one, over our English system, as all the "commended" cards were put up very soon after the prize cards, whereas nothing is seen of them in the Royal till the second day. When the barriers between the two yards fell with a regular thunder rattle at last, there was a pretty general rush to see the results, which had no doubt been duly whispered to the money-savers through the hoarding, as in those dark ages of judging, when exhibitors bored holes so as to get a good line of sight, or hired adjacent windows, at prices which made the leasors suspect that the entrée was required for no good Christian purpose.

The annual dinner took place in the Corn Exchange on Tuesday, at half-past five, and was attended by upwards of four hundred. The chair was occupied by His Grace the Duke of Argyll, K.T., President of the Society, who was supported on the right by the Duke of Buccleuch, Lord Henry Kerr, Lord Dingwall, Sir George Douglas, and Captain Percy Williams (who returned thanks for the Royal Agricultural Society); and on the left by the Earl of Roslyn, Lord Henry Scott, Rev. Dr. Grant, Mr. Robertson, of Ladykirk, M.P., and Sir W. Scott. The Earl of Haddington officiated as croupier, and was supported on the right by Viscount Strathallan, Mr. Stormouth Darling, Chief Magistrate of Kelloe, Sir G. Graham Montgomery, M.P., Sir John Marjoribanks, General Cotton; on the left by Lord Polwarth, Sir Hugh Hume Campbell, Sir William Macarthur, and Mr. Dudley Marjoribanks, M.P.

The Duke of Argyll spoke very well and at considerable length. His Grace's speech was principally directed towards the cultivation of proper grasses and green crops, and to combat the notion that the progress of agriculture mainly depends upon the growth of corn. Mr. Wilson, of Edgington Mains, whose recent treatise his Grace had quoted with much approbation, as analogous in its line of reasoning, and the results arrived at to Darwin's Origin of Species, returned thanks for the tenantry, and trusted that, as it would always be necessary for the farmers to grow some white crops, the landlords would not keep up too much live stock of a certain kind to help to eat them down—a neat counter, which was well received, but not reported. Mr. Hall Maxwell spoke last, and specially

referred to the excellent conduct of the men in charge of the cattle, both at Kelloe and Battersea, with whose charges we have now to deal.

CATTLE.

Even in the land of the Polls and the West Highlanders, the Shorthorn takes the place of honour, and this year the catalogue was headed by Master Annandale, a lengthy, nice-handling son of Abraham Parker, who came to claim his gold medium medal as the first prize bull at Dumfries. The old bulls made up a fine class, and The Duke of Tyne found the company so good that his owner stated most candidly that he was rightly placed third behind Forth and Van Tromp. Would that all exhibitors would be as frank, instead of wandering about to crab everything above them—a most miserable but a most fashionable solace! The first two were placed as Mr. Douglas and his colleague had put them a few weeks before for the silver medal as the best bull in the Stirling yard; but still a good many hung to "Van." He is a very useful and stylish beast, of great length, and with nice mellow flesh and hair, and a thorough bull's head. His crops are a little high, and his loins are perhaps not the best, but it is seldom that a bull is so even at five. Forth, on the other hand, is still the same "cloggy" animal he was when the Battersea bench sat upon him and made him their reserve gold medallist to First Fruits. He is now quite "the fat boy in Pickwick" among bulls, lacking in freedom and elegance, and decidedly clumsy when you stand behind him; but his depth of evenly-packed flesh is something absolutely marvellous, and he has exactly Beauty's Butterfly's girth—nine feet one. His maiden appearance was as a yearling at Perth, where he was second to Great Seal. Besides his Battersea prize, he won the challenge cup at Alloway last year, as the best bull of four counties, along with the first two-year-old and aged prizes, and this Highland Society prize closes his show career in Scotland. Whatever doubts others might express about his powers of service, they have none at Keir, as he has served eight cows this season, and several are just about dropping to him, including a small Ayrshire, which Mr. Young, who was determined to silence all cavils, specially put to him as the highest trial of his activity. Great Seal, who was second to him at Battersea, was the reserve on this occasion. He lacks sweetness in the head and horn, which is somewhat staggy, but he has grown into a tremendous upstanding beast, as level as a die, and "full of lean meat and constitution," and looks just cut out for a prize steer getter. Lord Strathallan's white Fosso had nice hind-quarters and form, but he wanted width and quality; and among the rest, one of high lineage was absolutely disgraceful.

The two-year-old bull class were very moderate; but if the third, Horatio Hopewell, bred by Mr. Unthank, of Netherscales, had been at all up to the mark, he might have walked away from all of them for character and make. As it was, he was pretty generally preferred to Prince of the Turks, a hard handling useful bull, and nothing more. Gamester, the winner, reminded us somewhat, in his head and colour, of Malachite, and was rather coarse and common throughout; while Havelock had "a nice head and hand," but was all to pieces in his middle. The fusion of bull-calves with bulls up to a year and six months, told sadly against Mr. Douglas's neat little Next of Kin, a son of Freemason and Rose of Sharon, and with a very nice coat and touch. The first prize taker, Messrs. Mitchell's New Fruit, was just twice his age, and a very wealthy lad, but getting rather gutty, and not first-rate in his loins, and the judges seemed to "doubt whether he would come again." He is a son of First Fruits and Mistletoe, the winner of seven firsts, and the only heifer in Soldier's Bride's class at Perth, which was able to

quality. This is her first calf, and a first prize has fallen to his lot in each of his four appearances.

In the cow class Pride of Southwicke, who had wisely given Queen of the Ocean a wide berth at Stockton, and set off for the land of her nativity, took head honours once more. She had really only one cow to meet, and that was Queen of Athelstane, which had calved to Freemason about seven weeks since. This beautiful red has scarcely grown since Battersea; but she preserves all that sweetness of character, and beautifully level wide-spread form, springy touch, and elegant offal, which we almost look for in vain elsewhere. The slight fleshy fulness about the shoulder points, which was equally observable on the roan Queen of Athelstane, has deceived some into the notion that her shoulders are not properly laid; but we cannot agree with them, and the senior judge assured us that he saw nothing wrong. Pride of Southwicke is not so good behind the shoulder, and her huggins try her; but she impresses judges with higher milking notions, and her nice kind head and fine sweeping frame fill the eye, and render it difficult to pass her in any ring. Nora Creina the Third was a big coarse-coated cow, with a cushion in keeping with her advanced years; and the commended Lily, with the good name and true of Raine of Gainford as her breeder, would have bulled many a provincial show-yard. Her prospects and a heavy journey from Worcester had knocked Flower-Girl about sadly; and although she picked up again as the show went on, she did not create half the furore which she did on the other side of the Tweed. She will remind us very much of what Wood-Rose was at her age, but with rather a Victoria 85th head. Pride of Athelstane goes steadily on, and seems to have corrected the slight depression about the loins, which did her no good at Battersea, although her top is not perfectly level. She has all the neatness of her dam about the head, and bids fair, if she goes on, to make a larger cow. Jeannette was far enough behind, and woefully disfigured by quite "a promontory" at the root of the tail. The younger heifers made a very nice show in the ring, but they were soon reduced to three—Lady Windsor, as neat, square, and snug a little white as man could wish to see in a summer's tour; Rosa Bonheur, a lengthy roan, a trifle harsh in her hair, and likely to frame into a slashing cow some day, if she keeps together; and Anne of Lancaster, who came third and won for Mr. Barclay his first Highland Society prize. Twins have great luck in England; but this roan is one of three, the produce of a Matadore cow in-calf to Lord Raglan, which was bought from Messrs. Cruikshank for 150 gs. The third, which was perhaps the finest heifer-calf of the three, was not born till 2½ hours after her sisters, and as they had naturally bedded her up and left her, it lay some time after its birth, and was not found till it was too late to rally it. These two sisters, Mary and Anne of Lancaster, were shown together at Perth lately, where Mary was second and Anne nowhere, a reading of their merits, against which Mr. Crofton protested, and, as it now seems, most justly, as Mary was here made the reserve.

The class of Polled Angus old bulls was a very superior one, and the judges, of which Mr. M'Combie was one, had great difficulty in placing the first and second. At length the level well-covered points of Fox Manie turned the beam against "Tom's" better back; while Prospero, the Battersea winner, who does not seem to have grown a bit, and to be light in his flank and rounded in his quarters, stood behind Prince of Wales, a useful rich-flanked fellow. Jim Crow jumped off, and won easily in the next class, by virtue of a rare flank and quarters; but, like all "the negroes," his middle might have been much improved by a rib from Booth's Monk. Julius Cæsar, a fair toucher, and a much bigger bull, but rather weak in the back, reversed the Battersea order for second place with Commo-

dore Truncheon, whose shoulders were not quite right; and a middling son of Prospero's walked over for the £10 in the class below.

The winning cow, Mr. Wemyss's Nancy, had youth and a rare calf at her side to help her. Behind the shoulder she was well made up, but her touch was not remarkable; and reversing these points, and adding a tendency to patch, we have the third cow Malcolm. Old Queen had the weight of seven and a-half years against her, but the judges seemed to think quite as much of the indentation at the top of the buttocks, which they ostensibly regard as the impure "mark of the beast," *alias* the Short-horn, as of her deficiency round the heart. On the former point Mr. M'Combie was quite impressive, and no one speaks with such world-wide authority. The first in-calf heifer, Quadroona, was beautifully compact, and possessed of a flank which it was a pleasure to handle; but her shoulders were not laid exactly right, and her head was a trifle masculine. Her companion, Rosetta, the first at Battersea, was second now; and a heifer, high and plain behind, went in for the bronze medal, simply because there were none to give her battle. Clio and Clariass, the first and second yearling heifers, were both good ones from Earl Kinnaird's herd; and so was Mr. Paterson's third.

The Polled Galloways, to which the last year's champion, Mr. Beattie, contributed no Moostroopers, had a medium gold medal matron at their head, in Harriet, the Dumfries cow small, but with style as good as her loins. Nelson, the first aged bull, had one of those regular-sided middles, and was not worth dwelling on much. In the three-year-olds, Hector kept the Battersea first place, to which his good handling and nice middle fairly entitled him, although he was rather defective over the tail. The Knight of Liddesdale was even, but hardly touched so well, and Mullock was better behind than any of them, but coarse in the neck and shoulders. Fergus stood alone in the yearling class, with a rare coat on his back; and then came a very grand cow class, with Mr. James Graham's Semiramis to head it. She was second at Dumfries last year, where she beat the Battersea cow Beattie's Bride-maid, and was behind Kate, rather a small one, and three years older, and the third on this occasion. Her middle was not remarkable, but rare ends atoned for it. Cunningham's Harriet, the second, was in a different class at Dumfries, and the Duke of Buccleuch got a commendation for his Mary Sad. In the two-year-old heifer class, His Grace took all three prizes. His Small Bones showed well when she was out, and has a very nice top and back, with good hair, but still she was rather small. Several thought that Miss M'Gill, the first at Battersea, had points enough, with her good top and touch and quarters to carry her first, but the judges may have considered her a trifle masculine in her head. There was no doubt about the third, Miss Gordon, being behind them, as her hair is not right, and she is a bit slack in the back as well. Of the yearling heifers we should say that the first was not first-rate—a nice handler, with a rich coat, but small in the thigh; the second, blotchy at her tail head; and the third, symmetrical, but rather under size, and hard in hand.

In the Ayrshire classes the Duke of Athole had to strike his flag before the Duke of Hamilton. The latter sent his well-known Sir Colin Campbell, the winner both at Perth and Battersea, looking well, but very round in his rumps, and arrived at quite an aldermanic state in his middle; which, strange as it may seem to a Southron eye, is a great point in this breed. The Duke of Athole's Colly Hill stood next him, and so did the red eleven-year-old Premium. They came simply to claim their gold medals, and were duly waited on by a kilted Highlander, and dairy-maid in the same costume, which made the milking time at Battersea quite a Belgravia removed, for the languid young fashionables. Premium is an eleven-year-old red, and now

not much to look at; but Colly Hill, although much lighter than when we first saw her, has that unmistakable head and horn and gay looks which ranked her as a belle on the banks of the Thames. The second aged bull, Carnal, had been a great winner in '62; but he seemed fairly caught and beaten here by Mr. McLachlan's bull, which was more masculine in the head, nearer the ground, and had a better twist and a most undeniable top. There was also much good about the third bull, from Hamilton Palace, and some thought it pretty nearly "heeds and tails" with the three. The two-year-old bull class brought Prince Charlie and Mrs. Rennie's bull side by side once more. The latter had the best of it last year, but it has been six times since a case of "follow my leader," and on this occasion the little fifteen months Defiance got between them. Many of the cows in-milk were rather out of bloom; and in this class the Duke of Hamilton was second and third to Mr. Fleming, and commended with one which seemed rather too big. Three out of his Grace's six entries came from the in-calf class, and furnished third and second. The winner was a good one; but there was a slight lack of character about the Duke of Athole's commended "Cambuslang." The two-year-old heifers had an entry of 26, and the yearling heifers of 20. For the former, Mr. Tweedie was second and third to Mr. Oswald; and in the latter, Miss Hope Johnstone's Young Holms, which was a trifle leggy, divided the Duke of Hamilton's pair.

In the Highland classes, the Duke of Athole quite made up his Ayrshire leeway, as he brought five Highlanders, all purchased from the late Marquis of Breadalbane's stock, and won four firsts and a second. As a lot, the Highland bulls were bad and the cows good. Among the latter were some beautiful cow-and-calf groups, and the dun Proshakanar, with her little dun calf, presented quite a type of wild Arran herd life. The queys, in their turn, were better than the cows; and, again, the ducal duns of Denheld and Arran were in opposition. The Duke of Athole headed the Duke of Hamilton, both of them standing on the Breadalbane blood; and Mr. John Malcolm was nearly as busy as the Duke of Athole among the prizes in this class. Among the fat stock there was a cross between the Shorthorn and the Ayrshire, sadly broken down in his training, and a remarkable fine level white, said to be between a Shorthorn and a Poll, but all Shorthorn to the eye. The Highland oxen were good, but some of them rather gone in the back; and if the Shorthorn-poll had kept its white nose intact, the black and white, described, as a cross of Shorthorn and Dutch, claimed one as black as ink, and did not make the Durhams care for those ancestral claims which the mynheers of Holland so strenuously thrust on them.

HORSES.

The Clydesdale array was very far before the one at Battersea, although there was no Sir Walter Scott at the head; and it earned its special mention from the noble chairman of the dinner. Mr. Kerr's Champion, who then played a modest second to the Hamilton Palace crack, appeared as its commander-in-chief, and received the medium gold medal, for which he qualified as first at Perth. He is a good-looking horse, albeit rather "gummy" in his hocks; went very fairly, and taped very well, although he was nearly two feet less than the 9 ft. 4 in. which his guardian so pertinaciously ascribed to him. Mr. David Riddell's black Campeie, bred by Mr. Kincaird, and placed first in the aged stallions, never won out of his district before, and had been beaten by Champion at Glasgow. He had the most liberty and action of the two, but there was a slight deficiency in his fore-arm. His second, Mr. A. Logan's "Lord Clyde," had won at the Highland as yearling, two-year-old, and three-year-old, and was thick and short without any very great action, a point which

brought up "Young Clyde" into the third place. The Duke of Athole's "Kinneil," a neat and good bay, with nice quality, was the reserve. The three-year-olds only made up a small class of seven, and action was again well served in the winner, Mr. Peter Craufurd's colt. The second was of a very beautiful colour, and rather smaller in his bone, and the third, "Avondale," rather counterbalanced his fine quarters and colour, by being slightly dipped in his back, and a trifle deficient below the knee. The two-year-olds seemed to be a rare thirteen, and were led off by "Baronet," a very clever horse, who has won at Paisley, Glasgow, and in the Perth district. He is the property of Mr. Stirling Keir, M.P., and was bred by Mr. James Patterson, of Wallace. Mr. Findlay, the breeder of the Prince Consort's Chelmsford prize winner, came second with the "Prince of Wales," and in the third, Mr. Clark's "Kilmaccolm," we had another proof that the Clydesdale breeders are not going so much for great size as for thickness and action. Mr. Peter Craufurd's first-prize yearling was very low in condition, but with great bone and rare good legs to go on with.

The Duke of Hamilton's very clever mare, with the first foal that has been dropped to Sir Walter Scott since his purchase, headed the mare-with-foal class, whose youngsters were well provided with extra hurdle space. None of the Keir mares came, and two of the five which were at Battersea have gone to New Zealand. Some of the Englishmen, who had conceived bay to be as orthodox a colour for Clydesdale as red for a Devon, were rather surprised to find that black had not only won a first prize earlier on, but that the third and reserve in this class were a cheanut and a grey. The mare-in-foal class was headed by a pair of very nice workmanlike mares, some of those Hamilton Palace winners which it was the delight of the late Duke to pick up at shows without caring much for the figure, but both were a trifle deficient in bone below the knee. In a fine class of three-year-old fillies, the Duke was first again with the last that his noble father ever purchased, when she won at Maryhill in June, and save that she seemed a trifle cowhocked, the critics could not pull her to pieces. Mr. Stirling's "Peggy" was also a compact muscular filly with finely formed legs, and again beat the third, as she had done at Glasgow. Maggie, the reserve, wanted size; and one filly had scarcely any of the Clydesdale about her. In the two-year-old filly class, the Duke of Hamilton was second to a nice but rather small one of Mr. W. Maxwell's, and took first yearling honours with a very promising one which had won at Glasgow and Maryhill, and passed into the late Duke's hands, it was said, for a cool hundred. Here she had very little to meet, and had simply to complete the four firsts, two seconds, and one third for Hamilton Palace, in what will be ever looked upon as a very great year.

The new £50 prize for a thorough-bred horse to serve in the district brought out a fair lot of a dozen; but the judges (Messrs. Percy Williams, Thompson of The Fife, and Hunt of Coldstream), had not much trouble in giving the prize to Mr. T. H. C. Wemyss's *Æsculapius*, a good-looking rich brown horse, by Young Physician, on a short leg, with capital thighs and arms, six foot one in his girth, fair hunting action, and wearing his nineteen years bravely. The Era was four years his senior, but he was all alive, and "came bounding out like a stag" to meet the bench. His quarters look as handsome as when he was a five-year-old, and though age has dipped his back, he can still show 5 ft. 11 in. by the tape. His hind-leg action is capital, but he was too small to reach the top of the tree. Something outraged him on the first day, and he was obliged to be taken out of the yard, and returned in milder mood on the following morning with a string of medals round his neck, and his near hind-foot in a large white

bandage. Young Hippolytus was light and sunk in his back, and wide in his bosom. Tipple Cider had really enormous bone and substance, but was very bad in his walking paces, and wide-shouldered; and Grouse was light in his bone and ribs, plain about the head, in at the elbows, and "talkative" as well. There was rather a blood-like appearance about Damask by Touchstone, but his feet were somewhat narrow, and his pasterns light. Little Hastings's back was capital, and his girth an inch more than the winner's; but light ankles, knees, and arms must have knocked off a great many points, and his action was wide both before and behind. Auchinleck's strong back had to be set against his short pasterns, not very perfect shoulders, and only moderate action. Storm, who is blind of an eye, is full of length and quality, but he is a weak horse for his size, and light below the knee. Ebony had been burnished up for some purpose, and as regards the toilet he was quite the Beau Brummell, but he is rather too straight, and not sufficiently elastic in his top, and his lightness of bone is not redeemed by good action. Mr. Milner is on shortish legs, and has a short back as well, but his hocks, knees, and arms are too light. Hotspur, with his avowed "h. b." brand, had no business in the class. He is simply a pretty hack, with a good six feet girth, and remarkably good action. Wee Davie moved well, with short pasterns, and toes in, but he had a heavy bad shoulder, and rather too much of the Punch about his head; and Hercules had a capital back and shoulder, but a light and shelly frame, with smallish feet militated against him.

The extra horses were of every kind. There was a bad dark brown sire by Russborough, to begin with; then came old Clansman unnoticed, but still true to his Voltigeur blood, and able to get stock with far greater substance than himself. Random, a fair thorough-bred chesnut two-year-old, was commended; and as regards Little Brunswick the pony stallion, C. may well stand for "commended" and "clever" as well. The Highland black "Corbeau" was a long-legged one, no thighs and all crest. The next eight were all hunter geldings, and among them the commended Auchinleck chesnut was a nice little fellow, but a trifle coarse in the hocks. The four-year-old by Wonder was too big, and with a faulty fetlock. Coquet de Ville had no action, and Mr. Hardie's gelding not much; The Young Assayer was flashy and blood-like; and the highly commended Phoenix bay was quite a cut-and-come-again gentleman, with a capital idea of moving as well. This was the only H. C. on the prize list, as it is not the rule of the Society to give them, and hence the "highly" which was written prominently in pencil over a "commended" card, we think in the sheep classes, could have been only a private note of admiration.

SHEEP.

The improvement both in the size, fleece, and general getting up of the Leicesters, of which there were 101 entries against 108 Cheviots, was very marked; and the shearing ewes and gimmers were remarkably large and ripe. The older rams were very fair, but less uniform in stamp. Mr. W. Purves, of Burnfoot, kept up his old charter, and the honour of the Kelso district. He only showed two in the ram class, and his unnoticed one, a perfect mammoth to look at, stood out in strange relief against the small but very neat and beautifully fore-quartered ram of Mr. Rannie's, which came second; while the third, belonging to Mr. Stark, was of the more modern high-bred English fashion. There were sixty entries for the Shearling Tups, and Mr. George Simson, of the Kelso district, Mr. A. Balfour, and Lord Polwarth finished as the first three; Mr. Purves and Mr. Simson being also commended. In the ewe and gimmer classes Mr. Simson had to yield to Lord Polwarth and Mr.

Purves, the latter of whom showed some rare specimens of early maturity. "Moodlaw" and his Cheviots were a name of dread once more; and the firsts in every class, as well as two seconds, found their way to father and son at Moodlaw or Kinnel-head, which will furnish about 150 tups and 30 tup lambs for their great biennial tup sale at Beattock on September 10th. Lammie, the hero on this occasion, is not to be let. This well-known three-shear was second at Perth to the Battersea sheep, and first at the Dumfries Union; while the second sheep, a two-shear, was never in a public pen before. The Brydon type, with its grand rein, rectangular quarters, bold masculine head, well-woolled cheeks, and rare "butcher's grip," has seldom been better illustrated than in this son of Hornie and the Old Pallie ewe, which is now fresh in her fourteenth year, and has had 22 lambs at 13 births. Mr. Elliott, of Hindhope, was third in both ram and shearing classes, and second and third in the ewes and gimmers. The blood of Hornie, the second old ram at Perth, held its own in both these classes, as the ewes, three and four-shear, were by him, and some of the gimmers by his son Hector. Mr. Paterson of Terrona's second prize pen of gimmers were also of Hector blood, and although they had not been much got up, their game and characteristic heads settled their claim at once. Strange to say, the Cheviots found no favour at Hamburg, and all returned home unsold.

Mr. Murray, of Penicuik, was A 1 among the black-faces, with Messrs. Drife, Archibald, and Wilson in for honours as well; but the winning ewes of the latter were not very "soty" on the point of wool. Gordon Castle deserted the Southdown classes, and there were only 8 rams and 3 pens of ewes and gimmers entered, and those by two men, for £54 and 4 bronze medals. Mr. Aitchison's tup, purchased for 40 guineas at a Babraham sale, was first in the aged class, and in the shearings Mr. Scot Skirving was second to that gentleman again, in contradiction to the previous East Lothian decision. Mr. Skirving had no opponent for ewes or gimmers, and showed a neat but rather small pen of the latter. Mr. Beale Browne made a successful raid with his Bath and West of England and Yarmouth Cotswold winner and two others, and stood first and third, with a grey-face of Lord Kinnaird's as "bodkin." The first was not for sale, but the third prize one was purchased at a fair figure by Mr. Sadler of Drem. Some years ago several Cotswolds came to Lockerby fair, and attracted much attention when they were led forth like ponies, but they gradually went out of fashion, more on the bigoted "I do not like thee Dr. Fell" principle than any other which we could ever discover. However, six Scotchmen showed them here, and Mr. Gibson, Mr. Skirving, and Earl Wemyss was the order of the finish for the "ewes or gimmers" prize. The "Shrops" made a first appearance, and the three tups each took a prize, but the judges did not extend the same courtesy to the single pen of females. Common and popular as the cross is on the border, no one but Mr. Calder cared to exhibit Leicester-Cheviots, and the Medium Gold, Silver, and Bronze Medals were borne back to Yetholm.

Pigs.

The show of pigs was a remarkably good one in every class; it numbered forty-nine entries, and the competition was far beyond what was seen at Perth. Mr. Wainman had five firsts, three seconds, and one third, and in three classes he was first and second, and was "run up" by pigs of his own breed. The eight pigs which had been sweeping away everything at Driffild, Bridlington, Hexham, and Gateshead were sent on to Kelso, where they received a reinforcement of a dozen younger ones; making, with the eighteen headed by Nabob at the Yorkshire, no less than

eight-and-thirty on circuit at once. However, in large boars, Mr. Fisher and his "talented company" could not get higher than third, Mr. Dickin's boar, which was second at Worcester, being first, Mr. Findlay second, the Royal Carhead champion "Worcester Duke" third, and Lord of the Wassail, which had won a Worcester boar-sow-and-offspring prize with Bright Hope, next, with a commendation. In the small boars, Mr. Wainman's Hamburg winner, Silver Beard, of the wonderful loin, beat his Worcester winner, King Cube. Silver Beard was selected for the sea journey, as it was thought he might be considered a little too large for his class at Worcester, and King Cube is well known in the pig world as having won sixteen firsts off the reel last year, with only one break, and that at Battersea.

Fresh Hope was an easy winner in the large-sow class, against Mr. Findlay and Mr. Dickin second and third, making her seventh win this year, in which her fame has extended from Exeter to Kelso. She is of Mr. Wainman's blood, by Flag of Truce from the Golden Dream strain, and was bought back when her budding shapes were discovered. The renowned Silver Wing was first among the small sows, and she looked so well that Mr. Gourlay Steel selected her as one of the cracks for his picture, and she was borne off in her truck across the yard to be photographed, along with Mr. Fisher and her peculiar guardian, "Little Kit." This is about her twentieth victory, and she has three litters already. There seems some truth in the boast of a pig-owner of much less standing than Mr. Wainman, that he only keeps two sows, and gets three days a week hunting out of the proceeds. Mr. Wainman was also second, with another sow, rather younger; and a North Wales breeder third, with one bred at Carhead. Three out of the litter of fourteen which went with Bright Hope to Worcester, viz., "Advance Symmetry," "Advance Quality," and "No Surrender" came to win the large pen under eight months, which they did easily enough; a three-months' pen, with rather longer snouts than the Carhead pigs generally wear, being second; and Major Dickins, of Coldstream, third. Three from a litter by The Nabob won the small-breed pen, but were separated this time from the commended young Silver-hairs by some regular little plums of Mr. Nicol Milne's, two months younger, and a pen of Earl Wemyss', described in rather general terms as "from 7 to 5 months and 2 weeks." The pig pens were highly popular on "the splendid shilling days," but still there was none of that keen criticism or appreciation which distinguishes a Lancashire and Yorkshire audience, five-sevenths of whom know the points nearly, if not quite, as well as the judges, and "rive them to pieces," in their broad native Doric whenever they catch them at fault, or at least fancy they do.

IMPLEMENTS.

The implement department, where a traction-engine gravely went through its performance of scenes in the circle, was diversified with a flower-show under canvas; and a mysterious little enclosure with a felted roof at one corner was devoted to Messrs. Mc'Glashan and Walker, who were taking photographs under the eye of Mr. Gourlay Steel for his forthcoming Highland Society picture of the leading agriculturists. The stallions were not in covered boxes, as in England, and left the yard each night; but we might well take a hint from the double rows boarded high up the middle, which both save space and prevent spectators, with their inexhaustible devices for irritation, from getting to the bull's heads, and making some of them half-crazed for life. Taking the strictly Scottish element among the stock, it was a wonderful sight. There stood in one grand line the whole length of the yard a century of sturdy Clydesdales, with white stockings almost to the hocks; the parti-coloured Ayrshires, with their clean

expressive heads and wedge-like figures; the sires and dams of "heavy blacks," round which the London butchers hold their earliest parleys with the salesmen at the great Christmas stock market; the Highlanders, black, dun, and red, looking, even in their subjection, the very monarchs of the strath; and the ruddle-coated, game-headed Cheviots, part of that great Clan Hornie which Brydon, like another Lowland chieftain, will lead in due season to the links of Inverness, and invite Sutherlandshire to the wager of battle.

The implement yard had 121 exhibitors, who, as the week advanced, and, more especially on St. James's Fair-day, did a pretty satisfactory amount of business. Mr. Pringle, "of Edinburgh, Berwick, and Kelso," had an enormous miscellaneous stand with nearly two-elevenths of the catalogue entries upon it; Messrs. Kemp, Murray, and Nicholson stood principally on Dray's reaping and combined machines, iron harrows, &c.; Perry and Son, of Glasgow, had sixty entries, more in the gate, rick stand, and ironfencing way; Mr. Hunter, of Edinburgh, was faithful to the cool delights of the dairy; the North British Rubber Company to belting, and tubing, and hose for irrigation; Mr. Hay Dounie, of Corstorphine, showed harness of every degree; Messrs. Young, of Ayr, relied more on a combined reaper and mower and drop sowing machine; Messrs. Jack and Son, of Maybole, on a new self-delivery reaper; and Mr. Radwin, of Jedburgh, on dipping troughs. Among the English makers, we had Richmond and Chandler with their rootwashers and sackholders; Pickaley and Sims with steel grinding mills and chaff cutters; Samuelson with his Victoria reaper and self-acting apparatus and cake breakers; Bentall with pulpers; Crosskill's Trustees with carts and waggons; Aveling and Porter with their traction engine; and Wood with his one and two-horse mower, and his drop platform one-horse reaper. Clayton and Shuttleworth brought their fixed and portable combined threshing machines, &c.; and Messrs. Howard, in addition to their formidable force of iron harrows, haymaking machines, and horse rakes, gave practical weight to the lines of Thomson, the poet of "The Seasons," which Mr. Stormonth Douglas quoted with peculiar felicity at the dinner, as by one born in the neighbourhood of Kelso—

"Ye generous Britons! venerate the plough!"

Their steam-plough was at work for some hours on Wednesday and Thursday upon a rather hard and stony clover-ley of Mr. Dudgeon's, of Spylaw, about a hundred yards from the station. Hitherto steam-ploughing has not created much interest in Scotland, as the farmers are not thoroughly convinced of its economy. However, Mr. James Howard's audience followed the furrow like rooks; and if they did not seem to admire the work of the cultivators so much as the Southrons do, they expressed themselves highly gratified with the ploughing, which accomplished without let or hindrance some rare eight-inch work, at the rate of an acre per hour. Colonel Hay, of Dunse Castle purchased the apparatus, and another has been sent to Rossie Priory for Lord Kinnaird.

The weather was most favourable throughout; and "the receipts of money on the whole," says the *Kelso Chronicle*, "have been satisfactory. On Tuesday the amount taken at the door was £264, being about £20 more than was received on the corresponding day at Perth. On Wednesday £200 was received, being £15 more than was taken at Perth on the corresponding day; and on Thursday the shillings taken yielded about £300, though the attendance was much larger than this would indicate, as great numbers were again present with exhibitors' tickets, while children were admitted free. Altogether, it is calculated that about 30,000 people have been admitted to the Show-yard."

The following is a list of the prize-takers—

CATTLE.

SHORTHORN BREED.

Gold Medal.—Bull "Master Annandale," W. Lambert, Haydon Bridge.

Old Bulls.—20 sovs., Wm. Stirling, of Keir, M.P.; second, 10 sovs., G. H. M. Home Binning; third, J. Wilson, Manor House, Woodhorn, Morpeth.

Bulls, 2 years old.—20 sovs., Wm. Lambert, Haydon Bridge; second, 10 sovs., Sir T. B. Hepburn; third, Andrew Haddon, Hawick.

Bull yearling.—10 sovs., A. and A. Mitchell, Alloa; second, 5 sovs., James Douglas; third, Lord Kinnaird.

Old Cow.—15 sovs., Lady Pigot; second, 8 sovs., James Douglas; third, Colonel Ferguson, of Raith.

Heifer.—10 sovs., the Duke of Montrose; second, 5 sovs., James Douglas.

Heifer, yearling.—8 sovs., A. J. Balfour; second, 4 sovs., Viscount Strathallan; third, medal, G. R. Barclay, of Keavil, Dunfermline.

POLLED (ABERDEEN OR ANGUS).

Old Bull.—20 sovs., Robert Walker, Aberdeen; second, 10 sovs., Alexander Bowie, Arbroath; third, Alex. Peterson, Keith.

Bull, 2 years old.—20 sovs., Alex. Bowie; second, 10 sovs., Alex. Bowie; third, the Earl of Southesk.

Old Cow of any age.—15 sovs., J. H. E. Wemyss, M.P.; second, 8 sovs., the Earl of Southesk; third, Alex. Ronaldson, Methlic.

Heifers.—10 sovs., the Earl of Southesk; second, 5 sovs., the Earl of Southesk; third, Alex. Paterson.

Heifer, yearling.—8 sovs., the Earl of Southesk; second, 4 sovs., the Earl of Southesk; third, Alex. Paterson.

POLLED (GALLOWAY).

Gold Medal Cow, "Harriet."—James Graham, Dalbeattie. Old Bull.—20 sovs., John Cunningham, Dalbeattie; second 10 sovs., William Keir, Tweedenside.

Two years old Bull.—20 sovs., Alexander Jardine, Lockerbie; second, 10 sovs., the Duke of Buccleuch; third, Robert Stobo, Auldgrith.

Bull Yearling.—10 sovs., James Graham, Dalbeattie. Old Cow.—15 sovs., James Graham; second, 8 sovs., John Cunningham; third, ditto.

Heifer.—10 sovs., the Duke of Buccleuch; second, 5 sovs., ditto; third, ditto.

Heifer, Yearling.—8 sovs., Welwood Maxwell, of Glenlee; second, 4 sovs., James Graham; third, Welwood Maxwell.

AYRSHIRE.

Gold Medal.—Bull, the Duke of Hamilton. Gold Medal.—Cow "Collyhill," the Duke of Athole.

Gold Medal.—Cow "Premium," the Duke of Athole. Old Bull.—20 sovs., W. A. MacLachlan, Balfour; second, 10 sovs., Robert Hewatson, Thornhill; third, the Duke of Hamilton.

Bull, 2 years old.—20 sovs., Robert M'Kean, Bishopbriggs; second 10 sovs., John Stewart, Strathaven; third, Messrs. Rennie, Kilayth.

Old Cow.—10 sovs., Alexander Fleming, Bothwell; second, 5 sovs., the Duke of Hamilton; third, ditto.

Cow in Calf.—10 sovs., the Duke of Hamilton; second, 5 sovs., David Tweedie, Abington; third, the Duke of Hamilton.

Heifer.—10 sovs., A. H. Oswald, Ayr; second, 5 sovs., David Tweedie; third, ditto.

Heifer Yearling.—8 sovs., the Duke of Hamilton; second, 4 sovs., Miss Hope Johnstone, of Annandale; third, the Duke of Hamilton.

HIGHLAND.

Old Bull.—20 sovs., John Malcolm, Lochgilphead; second, 10 sovs., the Duke of Hamilton; third, Allan Pollok.

Three years old Bull.—20 sovs., the Duke of Athole; second, ten sovs., John Malcolm; third, ditto.

Old Cow.—10 sovs., the Duke of Athole; second, 5 sovs., the Duke of Hamilton; third, Allan Pollok.

Heifer.—10 sovs., the Duke of Athole; second, 5 sovs., the Duke of Hamilton; third, John Malcolm.

Heifer Yearling, 1861.—8 sovs., John Malcolm; second, 5 sovs., the Duke of Hamilton; third, John Malcolm. Cross Heifers.—Gold Medal, Robert Logan, Birkenside.

HORSES.

FOR AGRICULTURAL PURPOSES.

Stallion.—Gold Medal, "Champion," William Kerr, Lochend, Kilbirnie.

Old Stallion.—30 sovs., David Riddell, Duntocher; second, 15 sovs., Andrew Logan, Crossflat; third, James Kerr, Kilbirnie.

Entire Colt, 3 years old.—20 sovs., Peter Crawford, Strathblane; second, 10 sovs., Hugh Vallance, Strathaven; third, James Lawrie, Mitchelson, Stow.

Entire Colt, 2 years old.—15 sovs., William Stirling, M.P.; second, 8 sovs., John Findlay, Easterhill, Glasgow; third, Samuel Clark, Kilbarchan.

Colt, yearling.—10 sovs., Peter Crawford; second, 5 sovs., David Riddell; third, Robert Wilson, Kilbarchan.

Old Mare (with Foal at foot).—20 sovs., the Duke of Hamilton; second, 10 sovs., Wm. Park; third, Alex. Naimith.

Young Mare (in-foal).—15 sovs., the Duke of Hamilton; second, 8 sovs., the Duke of Hamilton, third, H. D. Erskine, of Cardross, Stirling.

Filly, 3 years old.—10 sovs., the Duke of Hamilton; second, 5 sovs., William Stirling, M.P.; third, the Duke of Hamilton.

Filly, 2 years old.—8 sovs., Welwood Maxwell; second, 4 sovs., the Duke of Hamilton; third, Wm. Kerr, Balbirnie.

Filly, yearling.—6 sovs., the Duke of Hamilton; second, 3 sovs., James Lawrie, Mitchelson, Stow; third, James Mitchelson.

Thorough-bred Horses.—50 sovs., J. H. E. Wemyss, M.P.

SHEEP.

LEICESTER.

Four-shear Tup.—10 sovs., Wm. Parvie, Kelsae; second, 5 sovs., H. A. Rennie, Banff.

Shearling Tup.—10 sovs., George Simson, Kelsae; second, 5 sovs., A. J. Balfour; third, Lord Polwarth.

Five Ewes.—8 sovs., Lord Polwarth; second, 4 sovs., George Simson; third, Thomas Stark, Melindian.

Five Shearling Ewes.—8 sovs., W. Purvis; second, 4 sovs., George Simson; third, Thomas Simson.

CHEVIOTS.

Four-shear Tup.—10 sovs., James Brydon, Langholm; second, 5 sovs., Thomas Brydon, Moffat; third, Thomas Elliot, Jedburgh.

Shearling Tup.—10 sovs., James Brydon; second, 5 sovs., James Brydon; third, Thomas Elliot.

Five Ewes.—8 sovs., James Brydon; second, 4 sovs., Thomas Elliot.

Five Shearling Ewes.—8 sovs., James Brydon; second, 4 sovs., John W. J. Paterson, Langholm; third, Thomas Elliot.

BLACK-FACED.

Four-shear Tup.—10 sovs., Thomas Murray, Penicuik; second, 5 sovs., James Drife, Sanquhar; third, James Drife.

Shearling Tup.—10 sovs., Thomas Murray; second, 5 sovs., John Archibald, Stow; third, John Archibald.

Five Ewes.—8 sovs., John Wilson, Roalin; second, 4 sovs., Thomas Murray.

Five Shearling Ewes.—8 sovs., John Archibald; second, 4 sovs., the Earl of Airrie; third, John Inch, Liberton.

SOUTHDOWN.

Four-shear Tup.—10 sovs., James Aitchison, Haddington; second, 5 sovs., R. Scot Skirving, Drem.

Shearling Tup.—10 sovs., James Aitchison; second, 5 sovs., R. S. Skirving.

Five Ewes.—No Award.

Five Shearling Ewes.—8 sovs., R. S. Skirving; second, 4 sovs., R. S. Skirving.

LONG WOOLLED OTHER THAN LEICESTER.

Tup.—10 sovs., Thomas Beale Brown, Salperton Park; second, 5 sovs., Lord Kinnaird; third, T. B. Browne.

Five Ewes, not more than four-shear.—8 sovs., John Gibson; second, 4 sovs., R. S. Skirving.

SHORT-WOOLLED OTHER THAN SOUTHDOWNS.

Top.—10 sovs., Allan Thomson Douglas, Moneylaws; second, 5 sovs., John Gibson, Woolmet; third, Lord Kinnaird.

SWINE.

Bear, large breed.—8 sovs., Richard Dickin, Hanton Norris; second, 4 sovs., Thomas D. Findlay, Easterhill; third, W. B. Wainman, Carhead.

Bear, small breed.—8 sovs., W. B. Wainman; second, 4 sovs., W. B. Wainman; third, J. H. E. Wemyss, M.P.

Sow, large breed.—6 sovs., W. B. Wainman; second, 3 sovs., T. D. Findlay; third, R. Dickin.

Sow, small breed.—6 sovs., W. B. Wainman; second, 3 sovs., W. B. Wainman; third, Bronze Medal, R. Thomson, Kelston, Holywell.

Three Pigs, not exceeding 8 months old, large breed.—4 sovs., W. B. Wainman; second, 2 sovs., W. B. Wainman; third, Bronze Medal, Major G. C. Dickins, Coldstream.

Three Pigs, not exceeding 8 months old, small breed.—4 sovs., W. B. Wainman; second, 2 sovs., Nicol Milne, Melrose; third, the Earl of Wemyss.

NORTH LINCOLNSHIRE AGRICULTURAL SOCIETY.

The twenty-sixth annual exhibition of this Society was held at Boston on Wednesday and Thursday, July 22 and 23, and the meeting has certainly been one of the most successful ever held.

The trial of the steam cultivators took place on Tuesday and Wednesday, on a farm situate at East Vile, in the occupation of Charles Brooks, Esq., of Leake, and about ten miles distant from Boston. The trial land was a piece of summer-sowing seeds, and the surface was remarkably hard. The following is the award of the judges:

The prize of 20 sovs. to Messrs. Richardson and Darley, of Kirton Lindsey, for their steam traction engine, with Fowler's patent anchor, windlass, and steam cultivating and ploughing tackle complete. Highly commended: Mr. H. J. Seels, Wainfleet, for their steam engine, cultivator, and harrow, invented by Mr. W. Smith, Woolston, and manufactured by Mr. T. Ashley, Louth. Commended: Messrs. Amies and Berford, Peterborough, for their set of steam ploughing and cultivating apparatus, invented and manufactured by Mr. J. Fowler.

The judges were Mr. H. B. Caldwell, Lackham House, Chippingham; Mr. Thomas Oathwaite, Gouldsborough House, Knaresborough; Mr. Clara Sewall Read, Plumstead House, Norwich.

There was a very good show of live stock, the entries in the several classes being as follows: Shorthorn cattle 51, sheep 135, stallions 28, other horses 234, pigs 79, poultry 59. The following is the

AWARD OF PRIZES.

SHORT-HORNED CATTLE.

Bulls above one year old: Prize, 20 sovs., Messrs. Dudding, Panton.

Bulls three years old and upwards: Prize, 8 sovs., Mr. R. Dudding, Panton.

Two years old bulls: First prize, 10 sovs., Mr. Joseph Brookwell, Braceby; second, 4 sovs., Mr. R. Dudding, Panton.

Yearling bulls: First prize, 10 sovs., Mr. Wm. Torr, Ayleby Manor; second, 4 sovs., Messrs. J. B. and S. Slater, N. Carlton; third, 2 sovs., Lady Pigot, Branches Park.

Bull calves under a year old: First prize, 5 sovs., Mr. W. Odling, Buntingthorpe; second, 3 sovs., Messrs. Dudding, Panton.

Cows more than four years old: First prize, 8 sovs., Lady Pigot, Branches Park; second, 4 sovs., Mr. J. Lynn, Church Farm, Stroxtan.

Three years old heifers: Prize, Mr. J. Lynn, Church Farm, Stroxtan.

Two years old heifers: First prize, 6 sovs., Mr. J. Lynn, Church Farm, Stroxtan; second, 4 sovs., Lady Pigot, Branches Park.

One year old heifers: First prize, 6 sovs., Lady Pigot, Branches Park; second, 4 sovs., Mr. J. Lynn, Church Farm, Stroxtan; third, 2 sovs., Mr. W. Sisman, Buckworth Lodge.

She-calves under one year old: First prize, 4 sovs., Mr. R. Betts, Holbeck Lodge; second, 2 sovs., G. F. Henage, Esq., Haslton Hall.

LONG-WOOL SHEEP (NOT BEING LEICESTERS).

Rams of any age: Prize, 15 sovs., Mr. George Clarke, Canwick.

Shearling Rams: First prize 10 sovs., second 6 sovs., and third 3 sovs., to Mr. Robert Wright, Nooton Heath.

Two-shear rams: First prize, 8 sovs., Mr. Charles Clarke,

Scoopwick; second, 3 sovs., Mr. Jas. Lynn, Church Farm, Stroxtan.

Three-shear Rams: First prize, 6 sovs., Mr. G. T. Havercroft, Wootton Dale; second, 3 sovs., Mr. Charles Clarke, Scoopwick.

HORSES.

Mares for breeding hunters: First prize, 8 sovs., Mr. Clarke, Canwick; second, 3 sovs., Mr. W. R. Brockton, Farnham.

Mares for breeding draught horses: First prize, 8 sovs., Mr. Rd. Holmes, Donington Northorpe; second, 3 sovs., Mr. Chas. Smith, Frampton.

Mares for breeding roadsters: First prize, 6 sovs., Mr. John Kirkby, Algharkirk; second, 2 sovs., Mr. T. Randell, Owersby.

Hunting fillies, two years old: Prize, 5 sovs., M. Staniland, Esq., M.P., Boston.

Hunting fillies, one year old: Prize, 4 sovs., M. Staniland, Esq., M.P., Boston.

Cart fillies, three years old: Prize, 5 sovs., Mr. J. Baumber, Somersby.

Cart fillies, two years old: Prize, 4 sovs., Mr. F. Key, Swinehead.

Cart fillies, one year old: Prize, 3 sovs., Mr. T. C. Young, Belleau.

PIGS.

Boars, large breed: First prize, 5 sovs., Mr. John Hickman, Hull; second, 2 sovs., Mr. R. E. Dockering, Northorpe.

Boars, large breed, not exceeding twelve months old: Prize, 3 sovs., Mr. W. B. Wainman, Carhead.

Boars, small breed: First prize, 4 sovs., and second, 2 sovs., Mr. L. T. Thornton, Swallow Beck.

Boars, small breed, not exceeding twelve months old: Prize, 3 sovs., Mr. Wm. Allatt, Glington.

Sows, large breed: First prize, 4 sovs., Mr. W. B. Wainman, Carhead; second, 2 sovs., Mr. John Hickman, Hull.

Sows, small breed: First prize, 4 sovs., Mr. John Hickman, Hull; second, 2 sovs., Mr. L. T. Thornton, Swallow Beck.

Breeding pigs, not exceeding six months old (large breed): Prize, 3 sovs., Rev. F. Sugden, Hale Magna Vicarage.

Breeding pigs, not exceeding six months old (small breed): Prize, 3 sovs., Mr. L. T. Thornton, Swallow Beck.

TRIAL OF REAPERS.—The trial of the reaping machines in connection with the above show, came off at Sibsey, on the farms of Messrs. Thompson and Saul, this day (July 31). The number of machines entered for competition was very large, including Messrs. R. Cuthbertson's, Crosskill's trustees, improved two-horse and three-horse by Bell, Bannlett's one and two-horse, Pickaley and Sim's one and two-horse, J. Fletcher's, Samuelson's and Co., with many others. The trial commenced on a beautiful piece of white wheat, the property of Mr. Thompson. Crosskill's reaper opened the contest, and made very good work on the standing corn. Bannlett's and Fletcher's started next, and although the cutting was fair, the delivery was very inferior. R. Cuthbertson and Co's, Samuelson's, and Pickaley and Sim's, entered the arena next, and it soon became evident the contest lay between Cuthbert and Co's machine and Crosskill's three-horse reaper. Another field was then selected on Mr. Saul's farm—a heavy crop, and laid in places; and here it was that Cuthbert and Co's reaper distanced all competitors, making capital work, both in the standing and laid crops; and the judges, again, for the fourth time, awarded the prize of £10 (offered by the Right Hon. the Earl of Yarbro, president of the Society), to Mr. H. Smith, of Winterton, the agent for R. Cuthbert and Co's machines.

THE NORTHAMPTONSHIRE AGRICULTURAL SOCIETY.

MEETING AT KETTERING.

The Northamptonshire Agricultural Society now holds a two days' show, which is conducted in this wise: On the grand or first day, when you pay half-a-crown a-head for admission, the stock are judged in public, in conformity with the prevailing fashion. Acting, however, up to some peculiar views of their own, the committee do not sanction the issue of the catalogue until the second or shilling day, so that the high-price visitors pay a deal more for a deal less than their followers. It is, in fact, simply an afternoon thrown away, as you wander about, subject to an agreeable regulation which is especially framed to withhold information, beyond that you may obtain from some hapless herdsman, who, under the circumstances, has to declare, at a moderate computation about a hundred times in an hour, to whom his beast belongs, in which class he is entered, and so forth. The rule itself can only be construed into a particularly bad compliment to the judges of the day, who would perhaps get a sight of the entries, and then of course award the prizes, in strict accordance with their own personal leanings and feelings for any friend in the district. It is not likely that so utterly absurd and senseless a condition will be any longer enforced; but if any members of the Northamptonshire Committee would still adhere to so suicidal a proceeding, it may be as well they should know that at the shows of the Royal, the Yorkshire, and other important meetings, where open judging is practised, the public can obtain their catalogues so soon as the judges enter the ring, or immediately on they themselves passing on the show-ground.

Fortunately for anyone having to report on an exhibition under such needless difficulties, the Kettering gathering was by no means equal to some former shows of the Society, and the cattle, hunting horses, and sheep were very inferior to the composition of these several classes at Stamford last year. One of the best beasts was in the first section, which rather remarkably leads off, in what is otherwise essentially a show of breeding stock, with classes for fat animals. Here the all-England premium of £10 was won by Sir W. de Capell Brooke, with a very good ox, although it was a close thing between him and one of Lord Spencer's; but the latter is at present but a loose handler, and when they meet again, as they will at Christmas, the point for preference may be a yet nicer one to decide. Mr. Sisman, of Buckworth, had the best fat steer—only a middling animal—and Lord Exeter the next; while in the fat-cow class Mr. Fletcher, of Radmanthwaite, again beat Lady Pigot, and a very clear beating it was, though the famous Empress of Hindostan was thus put into the shade. Her conqueror is a long, good cow, with a rare touch, and plenty of flesh to back her quality. Sir De Capell Brooke was first again with a useful growing beast; but the small class was not

one of much character; Mr. Adcock matching the best Shorthorn with a Hereford of no higher pretensions; while the Welsh and Devon classes of grazing steers resulted in no entries; and it might be better by another year to substitute for these a class of Scotch beasts. In what is termed "the breeding or store stock" section, Mr. Doig, of Lillingstone, produced the best bull in Vampire, son of Marmaduke, and a very good one too, with a famous back, loin, and thighs; one of the Worcester Butterflies, now standing in the name of Mr. Fletcher, being amongst an otherwise very indifferent lot behind him. In the county class of bulls over two years old, Mr. Stopford's first is a fine, deep, massive, rich-handling one, with very few weak places about him; his style and use altogether confirming the character he obtained at Stamford last season, and now ranking him as by far the best bull on the ground. Mr. Longland was second with a thick, heavy-fleashed, shortish bull, Hayman; and Lady Pigot of course nowhere with the unsightly Viscount Windsor, whose continued appearance in public is altogether inexplicable. Surely the longer he is kept in the background the better for the herd he is for the nonce representing! Mr. Oliver's young bull was the first yearling, and Mr. Robinson, of Castle Ashby, sent a bad second, long and narrow, with weak thighs, and a bad head. Lord Spencer's Veil, the commended at Worcester, was the best cow, out of shape as she is, and the Branches Lady of Bonhill, with her still more unsightly rumps, the second. Amongst the heifers, another Bonhill was deservedly passed over, the premiums going to a couple of commonest bred ones, exhibited respectively by Mr. Pain, of Boughton, and the Duke of Buccleuch. Her Ladyship was more fortunate in the two-year heifer class, where Princess of Edward, with her nice quality and symmetry, won easily; Lord Spencer's second, Water Witch, having but little of the fine shorthorn character about her, and the three commended being "just" useful things. The yearlings were a more even lot, with Lady Pigot's high-bred but already patchy Lady Edburga as the best of them; and Lord Spencer's good curly-coated May Queen for second. The shorthorn steers ended in a division amongst the judges, two of which went for Mr. Doig's, and one for Lord Spencer's, the public being also anything but unanimous over the award—in favour of course of the commoner. William Moore's, or the cottager's prize heifer, might also have beaten some of the great men, had she gone against them; while the county prize of £20 included a long way the best female in any of the classes, of a fine quality, true symmetry, and good colour. This was Mr. Beasley's Jantga 7th, a heifer commended at Worcester, another Jantga receiving a similar compliment here.

The cart mares and foals made up a goodly show, with

Mr. Lewis Richards first, and Mr. Owen Wallis's Suffolk second; and the pairs in work were yet better; Mr. Wells, of Barton, showing four capital sets, including the prize and another highly commended couple. Of the riding horses the judges considered the "five-year-olds and upwards" a very good class, an opinion in which we cannot quite agree with them, and the lot would bear no comparison with the display of the same sort in Burghley Park. Mr. Gale's winner, a King of Oude horse, has not improved, and is at best but a common-looking one; but Mr. Sanders' Vortex colt, which was the first of the four-year-olds, is more clever and taking in his appearance; and Mr. Gale's hackney mare, another first, a very varmint one, though with a terribly plain head. Mr. Langham's old Cotherstone mare was the pick of the brood mares, and Mr. C. Watts' of the ponies, although not until after considerable discussion. Amongst the sheep Mr. John Shaw had some good ewes and theives, but the shearing rams were indifferent, and the sheep show altogether not very imposing. Mr. Sharman, Mr. Bland, and Sir De Capell Brooke divided the half-dozen premiums for pigs amongst them; and the £12 for the best collection of implements went to Mr. William Ball, of Rothwell. There was also due encouragement for poultry fanciers and butter-makers, with the customary series of rewards for good service and skilled labour, backed by a grand Flower Show, and a public dinner, for neither of which would our engagements elsewhere permit of our stopping. The Judges of cattle were Messrs. J. Coleman, of Woburn; E. Little, of Lanhill; and E. Wortley, of Oakham; for riding horses, Messrs. S. Dickens, and J. Gandern; of cart horses, Messrs. C. G. Fleaher and J. Topham; of sheep and pigs, Messrs. Abrahams, Cresswell, and Sanday; and of implements, Messrs. Murray and Sheffield. It is only fair to add that the stewards were very zealous in the discharge of their duties, and that the arrangements for "accommodating" the public were as inconvenient and ill-advised as possible.

PRIZE LIST.

BEASTS.—FAT STOCK.

For the best Ox of any breed, exceeding three years old, £10 to Sir W. De Capell Brooke, Bart., of Geddington Grange; and £5 to the Right Hon. Earl Spencer.

For the best fat Steer of any breed, not exceeding three years old, £10 to Mr. Wm. Sisman, of Buckworth Lodge, Hunts; and £5 to the Marquis of Exeter.

For the best fat Cow or Heifer of any breed or age, £10 to Mr. Wm. Fletcher, of Redmanthwaite, Mansfield; and £5 to Lady E. Pigot, of Branches Park, Newmarket.

GRAZING GLASSES.

For the best pair of Shorthorn or Cross-bred Steers, £5 to Sir W. De Capell Brooke, Bart.

For the best pair of Hereford or Shropshire Steers, £5 to Mr. Wm. Adcock, of Farndish.

BREEDING AND STORE STOCK.

For the best Bull of any age, £30, to Mr. Rd. Doig, of Lillingstone Hall, Bucks.

For the best Bull above two years old, £15, to Mr. W. B. Stopford, of Drayton House; and £5 to Mr. James Longland, of Grendon.

For the best Bull under two years of age, £15, to Mr. Rbt. E. Oliver, of Sholebrook Lodge, Towcester; and £5 to Mr. Thos. Robinson, of Castle Ashby.

For the best Cow of any breed, £10, to the Right Hon. Earl Spencer; and £5 to Lady E. Pigot.

For the best Heifer of any breed, £10, to Mr. Samuel Wallis, of Barton Seagrave; and £5 to the Duke of Becclesch.

For the best Heifer of any breed, above two and under three years old, £10, to Lady E. Pigot; and £5 to Earl Spencer.

For the best Heifer of any breed, above one and under two years old, £7, to Lady E. Pigot; and £5 to Earl Spencer.

For the best Shorthorn Steer, not exceeding two years of age, £5, to Mr. Rd. Doig, of Lillingstone Hall, Bucks.

For the best Cow or Heifer, the property of a cottager, £2, to Mr. Wm. Moore, of Cranley.

Annual prize for the best Shorthorned Heifer above one and under two years old, £20, to Mr. J. N. Beasley, of Chapel Brampton.

EXTRA STOCK.—BEASTS.

For the best Beast, Ox, or Cow in the yard, fed on Hope's Cattle Food, a Silver Cup, value £5 5s., to Sir W. de Capell Brooke.

HORSES.

For the best Stallion for agricultural purposes, £10 to Mr. John Manning, of Orlingbury; and £5 to Mr. Owen Wallis, of Overstone Grange.

For the best thoroughbred Stallion for Hunting purposes, £20 to Mr. Binyoun Drage, of Scaldwell.

For the best Mare and Foal, or in-foal mare, for hunting purposes, £20 to Mr. Francis B. Sharp, of Finedon.

For the best Mare or Gelding, five years old and upwards, adapted for hunting purposes, £20 to Mr. Samuel Gale of Kilmah.

For the best Mare or Gelding, above four and under five years old, adapted for hunting purposes, £20 to Mr. Henry Sanders, of Brampton Hill.

For the best Colt or Filly, under three years old, adapted for riding purposes, £5 to Captain J. R. Tippetts, of Barton Seagrave.

For the best Hackney (Mare or Gelding), under seven years old, not thorough-bred, £10 to Mr. Samuel Gale, of Kilmah.

For the best Pony, £5 to Mr. Charles H. Watts, of Kilmington.

For the best Mare for agricultural purposes, suckling a foal, £10, to Mr. Lewis Richards, of Glandon Lodge.

For the best Cart Gelding, above two and under three years old, £5, to Mr. F. M. Turner, Brixworth Lodge.

For the best Cart Filly, above two and under three years old, £5, to Sir Chas. E. Isham, Bart., of Lamport.

For the best pair of Cart Horses for agricultural purposes, £7, to Mr. Charles Wells, of Barton Seagrave.

SHEEP.

For the best 20 Long-wooled Ewes of any age, £10, to Mr. Thos. Burditt, of The Mansion, Pytchley.

For the best pen of three Long-wooled Shear Hogs, £5, to Sir W. de Capell Brooke, Bart., of Geddington Grange; and £2 10s. to Mr. John Beasley, of Overstone.

For the best pen of three cross bred Shearhogs, £5 and £2 10s. to Mr. John Marsh of Holcot.

For the best pen of five long-wooled Ewes, £5 to Mr. John Shaw, of Hunsbury Hill; and £2 10s. to Mr. J. T. Faulkner, of Cranford.

For the best pen of five long-wooled Theaves, £5 to Mr. John Shaw, of Hunsbury Hill; and £2 10s. to the Marquis of Exeter, of Burghley House, near Stamford.

For the best pen of five cross-bred Ewes, £5 to Mr. Charles Wells, of Barton Seagrave.

For the best shearing Leicester Tup, £10 to Mr. Samuel Wallis, of Barton Seagrave.

For the best shearing Lincoln Tup, £10 to Mr. Clark Hales, of Manor House, Basingbourne, Royston, Cambridge.

For the best long-wooled Tup of any breed, £10 to Mr. Robert Lenton Swingle, of Ketton, Stamford; and £5 to Mr. Thomas Burditt, of The Mansion, Pytchley.

For the best five Long-wooled Wether Lambs, £3 to Mr. T. W. D. Harria, of Wooton.

For the best five Long-wooled Ewe Lambs, £3 to Mr. John Beasley, of Overstone.

For the best five Short-wooled or Half-bred Wether Lambs, £3 to Mr. Charles Brimley, of Cranley.

For the best five Short-wooled or Half-bred Ewe Lambs, £3 to Mr. Charles Brimley, of Cranley.

PIGS.

For the best Boar of any breed, £5 to Mr. Thomas H. Bland, of Didgley Grange; and £3 to Mr. Mark Sharman, of Wellingborough.

For the best Breeding or Suckling Sow of any breed, £5 to Mr. Mark Sharman, of Wellingborough; and £2 to Sir W. De Capell Brooke, of Geddington Grange.

For the best three Fat Pigs of one litter, of any breed or age, £5 to Mr. Mark Sharman, of Wellingborough.

THE YORKSHIRE AGRICULTURAL SOCIETY.

MEETING AT SOUTH STOCKTON-ON-TEES.

It was a grave question with many whether a meeting at so one-sided a site as Stockton-on-Tees would be to the advantage of the Yorkshire Agricultural Society? while the result proves that any such fears were not altogether unfounded. Estimated by that most direct of all tests, the number of entries, it is many years since there has been so short a Show; for in almost every class or section the amount of competition was unmistakably below the average. There may be many reasons for this, prominent amongst which will be the renewal of hostilities between the rival Houses of York and Edinburgh, or a certain amount of opposition to which the county Society has been subjected nearer home. Either of these influences might have weeded out the original nominations on actual appearances, though still we are inclined to believe that the spot selected had more to answer for. The very neighbourhood did not much incline to the election, and for the greater majority of visitors Stockton was not merely out of the way, but difficult to reach. The Stockton and Darlington Railway is chiefly celebrated for being always behind time—say a liberal half-hour at least; and the Preston Junction is perhaps the most utterly inadequate and altogether abominable attempt to deal with any concentration of traffic that can be found on any line in the three kingdoms. Anyone, consequently, who has ever been in that confusion worse confounded, will be pretty certain never again to encounter another crowd at the “change here,” and the Yorkshire Society may have suffered in consequence. In fact, the journey through from York to Stockton is at best but a hazardous one; where they shift you at Thirsk, or take you on to Darlington—of course with an extra charge for the pleasure of going round; or only book you to Preston going back, where and when, after much toil and trouble, you ask for a ticket, or the clerk asks you for yours, and you warmly exchange cards at the window, the official availing himself of this admirable opportunity to collect the Stockton tickets before he issues any other! How long the stock-trucks or horse-boxes hung about here it may not be profitable to inquire, but for all the wants of due accommodation, organized arrangement, or common civility, we repeat that, under anything like a pressure, the Preston Junction ranks without a rival. The line, as we hear, is pleasantly styled “The Quaker’s Railway;” and, if so, the Society of Friends have a somewhat peculiar plan of dealing with their customers—very hard language being the customary apology for any especial inconvenience or annoyance to which the traveller is treated.

Our own experience, then, tends to assure us that a passage through the Straits of Preston is not an agreeable introduction or farewell to a large meeting at Stockton; and the attendance during the earlier part of the week would seem to indicate the same uncomfortable conclusion

in the public mind. On Wednesday, when, as had been announced, the cattle, sheep, and pigs were brought before the judges, the company was very thin, without being very select, and the proceedings altogether flat and discouraging. Of course the great attraction of the day was the Shorthorn ring, into which small classes continued to follow, although the quality of these was generally in an inverse ratio to their numerical strength. In fact, with the exception of Mr. Wilson’s best bull, and Lady Pigot’s first cow, almost all the more renowned animals of this breed were at Stockton, although when Mr. Unthank was seen to be again on the bench, everyone felt that the Royal awards would be only the further confirmed. And so it was. In the opening class of aged bulls, General Murst again met his Worcester friend, who of course placed him first here, with Lord Zetland’s big, useful white, commendable for his touch, but objectionable for a plain head and light neck, as the second best, in preference to Lord Feversham’s far more fashionable Oxford. This, however, is not quite the Royal reading, where Vice-Chancellor was highly commended, and Savile commended merely, and we unhesitatingly prefer the first trial to the second, by when Mr. Unthank no doubt had it more his own way. In the absence of The Hero, Colonel Towneley succeeded to the first place amongst the younger bulls with Royal Butterfly 11th—very airy and stylish, as we wrote of him at Worcester, but not so much on the leg as we once estimated him. He is, indeed, all over a very clever young bull, Mr. Middlebrough’s second being of a different stamp—thick, but common. Mr. Parker’s Chorister by Vice-Chancellor is another deep, square beast; and Mr. Linton’s Hugo has good length and fine quality to warrant his *high* character in the ring. It does not say much for the yearling class, when such a beast as Prince Victor could finish second: nor is the winner, with his bad rumps, a very imposing one to look over, though he certainly improves when you get him out. The judges, however, went on to commend a couple of plain young things in this lot, but they utterly overlooked Mr. Fawkes’ thick, useful Gavarna, who, though by no means perfect in his points, will see a better day. The best bull-calf, Battersea Prince, is small, straight, and neat, with a genuine Booth touch, good ribs and flank, and long hind quarters. The Prince has previously won at Hexham and Gateshead; and being by Prince Arthur, out of Queen of the Ocean, it is said that 1,000 gs. may be already had for this eleven months’ calf! The Butterfly, who made his debut here as second, is very bloodlike, with a beautiful bull’s head and neck, masculine but not coarse, and with fine length and a good loin. One of the Farnley herd was specially commended for his capital coat; but a good-looking very young one of Mr. Trotter’s rather failed when you put your hand on him, or he otherwise should have

commanded some such similar compliment. Pride of South-wick was away in the north, Rose of Lancashire down calving at home, and Mr. Middlebrough's entry also an absentee; so that the still handsome Queen of the Ocean had nothing to beat for first but her companion in the couples at Worcester; while Rosedale and Queen of the May "the 2nd" were again in their previous positions at the head of their class, though neither look much like qualifying for the herd, whatever they may do for the butcher. A "couple of beautiful Butterflies" were again amongst the highly commended behind them, where Lord Feversham's handsome Lady in White had also some further notice. Two of the three three-year-old cows, though all distinguished in the prize-list, are more or less lumpy, Mr. Teunant's white being but a plain one, and Mr. Hall's better looking, but patchy; while even the winner has a certain vulgarity about her, that does not make the class as high as it reads in the return list. Frederick's Farewell and Castanira again occupied their Worcester places, and Butterfly's Pageant was once more a prize calf in a short class, and with her superior of course well out of the way in the far East. In fact, with the same stock and the same very visible leaning on the part of the judges, one Meeting was much like the other, and public form proved to an ounce. Of course Mr. Unthank would not go to contradict his previous doings, and, if anything, he had only more his own way in the North than in the South; with Booth blood carrying off all the honours, and Bates' just an occasional commendation. Dairy cattle do not make much stand in this part of Yorkshire, where fat beasts are the more appreciated, and Mr. Pease's ox was the subject of continual admiration. He is certainly a wonderful animal, though his owner is said to have a better at home. The Smithfield Club cup heifer, Rosa, is also still in training; but at over four years old, the feeding on of a beast so long since ready for the shambles sounds something like a practical absurdity; but she is about the only Bates winner.

The sheep show also evinced a terrible falling-off in point of actual numbers; and it is many long years since the Yorkshire Society owned to there being actually not fifty entries in all, taking long-wools, short-wools, mountaineers, or extra stock. Still the first class of long-wool shearlings was a very creditable one, either for general competition or individual excellence, and the judges commended the class. But Mr. Abraham's Lincolns had no chance with the Leicesters, where even Mr. Borton had to bow to Mr. Stamper, and not for the first time this season, as the Highfield shearlings have already beaten the Borton rams at Bridlington and Helmsley. Mr. Stamper's three, as shown at Stockton, are by a Sledmere ram, out of Holme Pierrepont ewes, and his first prize, a very clever, compact sheep, round in the rib, firm in his touch, and with every sign of a good constitution. In the small lot of old rams Mr. Borton had it more his own way with the Royal sheep, also the best here; but the second at Worcester was shown amongst the extra stock. The pens of gimmers were the only other classes of longwools that produced any competition, and here Mr. Wiley's blood told at last, if he could not reach to a place amongst the shearing rams. Lord Wenloch's Southdowns, with scarcely enough breeding about their heads, are very serviceable, and Mr. Smith's horned sheep really grand, but not exactly of the pure mountaineer air and stamp; while they took their two premiums without any competition whatever.

Even the pigs were less—in numbers that is, not in size, as we seldom saw them larger; and a real Yorkshire big pig is a very wonderful animal, if not a very attractive one to the eye. Indeed, they seem to be getting them too big and coarse for bacon, as they are too fat for breeding.

It struck us that the show in any way was not up to former years, although many of the best men, with the exception of Mr. Mangles, were amongst the exhibitors. Only three large boars were entered, all of which were approved; the companion class of sows, with more competition, being commended in a lot. If the smaller sorts did not find so much general favour with the judges, there were yet some far better pigs amongst them; such, for instance, as Lord Wenloch's—true and handsome in their make and shape, and of a very superior quality to the immense Yorkshire hog, that natives lean over in such intense admiration. Mr. Wainman, it will be seen, was not quite so strong as heretofore, taking the section through; but his pigs were scattered, some being "on" at Kelso, while his friends were amusing themselves by reckoning up how much money the Carhead piggery had taken in public prizes during the last two or three weeks—at Worcester, in Scotland, and in Yorkshire. We did hear the amount, but have not had time to prove the calculation.

On the day previous a few of the more interested had been inspecting the implements, or rather the field trials, where Fowler's steam-plough was still the great attraction. The local committee had offered two premiums of £50 each: one for the best means of general cultivation by steam-power, and the other for its application to small holdings. Rather remarkably, however, there was no competition, although, as we hear, both Mr. Smith, of Woolston and the Messrs. Howard of Bedford talk of declining the secondary honours awarded them at Worcester. Surely if these manufacturers were dissatisfied with the decisions of the National Society, they should have moved for a new trial, in another Court, at the first opportunity—and this they could have obtained at Stockton. As it was, Fowler did capital work, on a very trying, hard, harsh piece of land, which he moved with the greatest ease: illustrating, in a word, the practical value of his system at every point. The judges rather demurred, at first, to awarding both the premiums without any contest whatever, but the performances were so good and so full of proof that they felt they could not get away from them; and Mr. Fowler has the further benefit of recording honours very honestly won. Yorkshire is closer home than Kelso, and if a man maintains that he has not been fairly beaten, his argument cannot go for much until he makes up his mind to fight again. The mowers in work were all commended, and their different points of preference are so well known that we are spared any necessity for invidious analysis in the face of the general approval of the judges. The eight called on for trial were from the following, all more or less known firms:—Samuelson (in the hands of an agent); Walter A. Wood, London; The Busby Agricultural Implement Company, Newton-le-Willows, Bedale; Kearsley, Ripon; Brigham and Bickerton, Berwick; Bamlett, Ripon; Pickley and Sims, Leigh; and Burgess and Key, London. The award, it will be found, did not go quite by previous line and rule; and two Ripon firms carried away the premiums against such acknowledged good work as that of the two great rival houses of Wood, and Burgess and Key. The prize-list will speak to the nice distinction of merit in other cases, conspicuous amongst the successful competitors being Coleman of Chelmsford, with his unrivalled and universal cultivators; and the Hornsbyes, for divers improvements, and encouraging advancement in turnip-cutting, root-pulping, and wheel-ploughing. This return will also speak to the presence of many more good firms; while other leading manufacturers, like Clayton and Shuttleworth and the Tuxfords with their engines, and Humphreys with his thrashing-machines, were at work; and the entry here, though some hundreds behind that of York last year, will bear better comparison with some former anniversaries.

The business of the Yorkshire Society's Show is thus arranged:—Implement trials on Tuesday; judging cattle, sheep, and pigs on Wednesday; and horses of all breeds and ages on Thursday; while Friday is devoted to one general view. On the Wednesday, however—quite early in the week, as the Royal Society should remember—comes the General Meeting, when Lord Wenlock was elected President for the ensuing year, and Howden selected as the place of meeting for 1868, the only other offer being from Beverley, which also sent up a deputation. The heavy rain in the afternoon rather interfered with the dinner under canvas, where Lord Cathcart officiated for the President, Lord Zetland; and when, in the course of the proceedings, Mr. Dent Dent, M.P., who was one of the stewards at Worcester, said, "He had heard it remarked that agricultural shows had done all the good they were capable of, and that now they ought to be treated as a sort of bazaar or sale-yard for stock. He did not at all believe in any such idea, and considered that if the farmer did not keep up his live-stock to the mark, and attend to their improvement in breed, we should soon see the stock of the county deteriorating in blood and value. Agricultural societies tended to promote the breed of good cattle, and ought to be maintained as managed at present. It was said that cross-bred beasts paid the best, but it was necessary to have pure-bred animals to start from, otherwise they would soon get an inferior sort of beast by continuing the cross-breeds." We recommend this to the best attention of Mr. Thomas Dyke Acland, and other such gentlemen; who seem to argue that, as agricultural societies have really done so much good, they should now be carefully restrained from pursuing a course of action which has worked so well.

But however varied might have been the attractions for Wednesday, in the way of Shorthorns or sheep, feasting or speech-making, the grand day of a Yorkshire show is when the horses come before the judges; and on Thursday the ground was really well filled, between nine and ten thousand visitors dropping their shillings at the gates. Still, the horse classes were only good in places, the strength of this section gradually rising from a very meagre exhibition of heavy draught horses to a middling lot of coachers, and so on to a capital entry of hunters. The same set of judges were called upon to decide over the merits of the cart and coach horses, and on a plan that was certainly calculated to try a man's eye to the utmost. Instead of clearing off the carters and then going on to the lighter breeds, they commenced, for example, with the coaching mares and foals, which were followed by the agricultural mares and foals; and these in turn by the coaching three-year-olds, to be succeeded by the cart three-year-olds, and so on; the catalogue being arranged on the same puzzle principle. Surely it would be better to let the Judge's eye become well accustomed to one type of animal, than to shift him about from old cart-horses to yearling carriage fillies; while the hunting horses with their own trio of Judges should as certainly have a place of their own on the list, instead of being mixed up as they now are with everything else. The majority of the half-dozen cart-stallions looked more suited for the brewer's dray than field work, the first and second being both very heavy horses; while the south-country Judge evidently hung to a lighter and more active one, Black Sultan; but, with two to one against him could get nothing more for his favourite than a high commendation. There were only two cart-mares and foals sent into the ring, the chestnut, which won, being a strong compact animal, with a famous chest and good action; while the other owed her high commendation to her capital foal, which was sold there and then for £80. Mr. Pease's was the only three-year-old gelding, but a very good one he is, if a little light about the hocks; and Sir George Wombwell supplied the

one filly of the companion class—a big grey, with fine shoulders and quarters, but a weak middle. There was, again, but one plain two-year, and a single pair of useful, but by no means prize draught-horses in work; and these brought us to the end of perhaps the poorest show of cart-horses that were ever brought together under the auspices of so influential a society. Neither were the coachers very generally much better represented, though with a few animals amongst them whose merits tended, in some degree, to make up for many other weak places in this department. Some of the stallions, however, were so evenly excellent as to cause a long discussion amongst the judges; Mr. Barthropp's preference for the better-bred one by Pottinger, and a very clever colt, being eventually supported by Mr. Johnson, who at first appeared to go with Mr. Hodgson for Yorkshire Lad. There were some very good mares and foals, with the best of them—Venus—well named, and as handsome as need be; whilst she has been first before now, but seldom in better company. Her son, a three-year-old gelding, wants more time, and the award went against him to a smart brown horse, the property of Mr. Jackson, of Ainderby. The action of the best coaching-filly fairly took their worships by storm, despite her having rubbed her mare; and a flash-looking son of Inkerman Hero was pronounced the first two-year-old, though beaten for back and hind-quarters by Mr. Callender's Motley gelding. There was but one yearling filly—a daughter, however, of Venus, and very like her. Of the nine Cleveland stallions, the winner turned up in an own-brother to the second-prize coaching stallion, and a far better one than his younger relative, the second, Volunteer, being blest with only a plain head, but the more important point of fine action. The Cleveland mares furnished decidedly the best class of any of the coachers or carters; Mr. Scurr's four-year being a regular clipper, and just the sort to go on with. Damsel is also a very smart mare, and Fanny Fern well worthy of commendation. Over the two three-year-old fillies the Redcar return was amended; with an own sister to Mr. Benton's other one as the best two-year-old, and a colt of Mr. Robinson's having it all his own way in the class of yearlings, where, as in too many other cases, the competition was reduced to a match.

It is, though, for hunting horses that the Stockton meeting will live in story, and a very long and trying day's work, with so many good ones before them, had Messrs. Naimby, Ellerby, and Jacob Smith. The four-year-old, five-year-old, and aged classes, took up an immense deal of time in inspecting, but not more than they deserved, as the entry included all the famous winners of the Royal Worcester, the Lincolnshire, Boston, and the Yorkshire Driffield. The four-year-olds were a wonderfully good lot, and as each judge appeared to take to his horse, there promised to be no solution of the difficulty. However, eventually the white ribands went to a chestnut by King Caradoc, the property of Mr. Holmes, of Beverley—a very perfect, true-made horse to stand alongside of, but with fatally bad action, the more particularly in his trot, going, in fact, so out of form, and "one-sided," as it were, that it is somewhat strange how they could pass him. The second-best, another chestnut, is one of the sweetest nags ever seen, with a beautiful head and neck, fine shoulders, a good body, and famous action. On this showing he should have been first, while the two next were Mr. Hall's Flyer—a fine upstanding old-fashioned horse, with his shoulders not quite right and his action to match—and the Van Galen gelding that won at Redcar. Despite the presence of Blondin, or the Clumsy horse, who has visibly improved since last year, Lord Wenlock's premium was entirely between two—Mr. Booth's Worcester nag, and Mr. Musgrave's Overplus, who beat that large field at Driffield the other

day, and who fairly won again on his merits at Stockton. For quality, substance, and liberty, the chesnut is the very model of the modern hunter; and never did we go more with a decree than when the judges declared in his favour. Enchantress, a mare that has thickened considerably but lost something in style, was pronounced to be preferable to that handsome horse, First-whip, amongst the all-aged; whilst there were many smartish twos and threes, and between thirty and forty hacks in one lot. But here the sample was not so good, and far away the nearest Mr. Guant's little chesnut mare; the winner, also by All-fours, making a deal of fuss when set going, but by no means giving one the notion of a pleasant horse to ride. There were four thorough-bred stallions, headed by Cavendish, whose defeat by such a horse as Neville all Yorkshire cannot understand. The brown looked better and brighter in his coat than at Worcester: and against such tackle as Motley, Causton, and High Treason the award was a foregone conclusion. Nevertheless, there is a deal to like about the little Touchstone horse, but Causton has nothing beyond mere size in his favour, and Mr. Jaques' blood-like nag, as pretty as a picture, has terribly weak pasterns, with other infirmities to which horse-flesh is heir. He was the only one of the four that the judges refused to notice in their return. This riding-horse ring was thronged ten or twelve deep the whole day through, with people mounting chairs, forms, and hill-sides, or anywhere for a view of what was unquestionably the centre-piece of the Meeting. Hard though it may be to write it, the Stockton Show of the Great Yorkshire Society would have been nothing but for "the nags."

PRIZE LIST.

CATTLE.

JUDGES.—T. Barber, Sproatley, Hull.
George Bland, Coleby, Lincoln.
J. Unthank, Nethercales, Penrith.

SHORTHORNS.

Bulls of three years old and upwards, £20, J. Charlesworth, Hadfield, Dewsbury (General Marat); second, £10, the Earl of Zetland (Saville). Commended: W. Harrison, Newbiggin, Sedburgh, Darlington (Prince Albert), and Lord Faversham, Dancombe Park (Vice-Chancellor).

Bulls of two years old, £20, Col. Towneley, Towneley Park, Burnley (Royal Butterfly 11th); second, £10, J. R. Middlebrough, South Milford. Highly commended: S. Parker, Pockley, Helmsley (Chorister), and W. Linton, Sheriff Hutton (Hage). Commended: J. Emerson, Over Dinsdale, Darlington (Lord Augustus).

Yearling bulls, £20, R. Gell, Grimston Lodge (Master Goldschmidt); second, £10, Lady Pigot, Branches Park, Newmarket (Prince Victor). Commended: R. Tennant, Scarcroft Lodge, Leeds (Young Prince), and C. Smith, Westerdale, Grosmont (Prince Charley).

Bull calves, upwards of five months old, £10, R. Booth, Warlaby, Northallerton (Prince of Battersea); second, £5, Col. Towneley (Royal Butterfly 14th). Highly commended: F. H. Fawkes, Farnley Hall (Lord Lionel), and H. Morley, Melbourne, Pocklington.

Cows of any age, in-calf or milk, and having had a live calf, £15, R. Booth, Warlaby (Queen of the Ocean); second, £5, R. Booth (Soldier's Bride).

Three-year-old cows, in-calf or milk, and having had a live calf, £10, J. Wood, Stanwick Park, Darlington (Corrie); second, R. Tennant, Scarcroft (Yorkshire Rose). Highly commended: J. Hall, Warton Bank, Kilham, Lancashire.

Two-year-old heifers, in calf, £10, Lady Pigot (Roseale); second, £5, R. Booth (Queen of the May 2nd). Highly commended: R. Booth (Graceful); Lord Teverham (Lady in White); Col. Towneley (New Knight's Butterfly), and Col. Towneley (Royal Butterfly Duchess). Commended: The Hon. G. R. Lascelles, Harewood (Golden Crop).

Yearling heifers, £10, Col. Towneley (Frederick's Farewell); second, £5, Lady Pigot (Castania). Highly commended: Col. Towneley (Bampton Butterfly). Commended: W.

White, Burrill, Bedale (Rose), and W. Hull, Warton Bank, Kirkham (Kent Cherry).

Heifer calves, upwards of five months old, £5, Col. Towneley (Butterfly Pageant); second, £3, G. S. Foljambe, Osberton Hall, Worksop. Highly commended: T. Jolly, Warlaby (Empress of the Sea). Commended: R. Tennant (Cora).

Fat oxen, under four years old, £5, J. W. Pease, Darlington. Highly commended: T. Stanforth, Storrs, Windermere.

Fat cows or heifers, £5, R. Tennant, Scarcroft Lodge (Rose). Highly commended: J. Bulmer, Middleton-one-Row, Darlington. Commended: J. W. Pease.

CATTLE OF ANY BREED.

Cows for dairy purposes, £5, J. Herring, Middlebro' (Daisy); second, £2, H. Morley, Melbourne. Highly commended: J. T. Robinson, Leckby, Topcliffe, Thirsk.

EXTRA STOCK.—A Silver Medal to R. Booth, Warlaby (Queen of the Vale).

SHEEP.

JUDGES.—W. Bartholomew, Waddington Heath, Lincoln.
J. Buckley, Normanton, Rutland.
G. Leighton, Osgodby, Scarbro'.

LEICESTER OR LONG-WOOLLED (NOT COTSWOLD).

Shearling rams, £15, R. Stamper, Highfield House, York; second, £5, J. Borton, Barton House, Malton. Highly commended: E. Riley, Kipling Cotes Farm, South Dalton, Beverley. Commended: T. Stamper, and J. Borton. The class generally commended.

Rams of any age, £10, J. Borton; second, £5, J. Borton. Highly commended: J. Simpson, Spofforth Park, Wetherby.

Pens of five ewes, £5, J. Simpson, Spofforth.

Pens of five shearling wethers, £5, Geo. L. Fox, Bramham Park.

Pens of five shearling gimmers, £10, S. Wiley, Brandaby; second, S. Wiley. Highly commended: G. L. Fox.

SHORT-WOOLLED.

Shearling rams, £10, Lord Wenlock; second, £5, Lord Wenlock. Commended: Lord Wenlock.

Pens of five shearling gimmers, £5, T. Harris, The Chase, Ulceby; second, £2, T. Harris.

MOUNTAIN.

Black-faced rams of any age, £5, C. Smith, Westerdale, Grosmont; second, £2, C. Smith.

EXTRA STOCK.—Silver Medals to S. Wiley, Brandaby (for Leicester ram), and J. Borton, Barton (for Leicester ram). Highly commended: Lord Wenlock (for Southdown ram).

PIGS.

JUDGES.—W. Bartholomew.

J. Buckley.
G. Leighton.

Boars of a large breed, £5, J. Hickman, Hull; second, £5, J. Dyson, Adelphi Hotel, Leeds; commended, W. B. Wainman, Carhead, Cross Hills.

Sows, large breed, in pig or milk, £5, E. Harrison, Woodhouse Moor, Leeds; second, £2, W. B. Wainman. The class commended.

Boars, small breed, £5, W. B. Wainman; second, £2, J. Dyson; commended, Lord Wenlock.

Sows, small breed, in pig or milk, £5, J. Hickman; second, £2, S. Wiley.

Boars of any breed, £5, W. B. Wainman; second, £2, Jas. Graham, York Road, Leeds.

Sows of any breed, in pig or milk, £5, J. Hickman; second, £2, J. Hickman.

Three store pigs, of any breed, and of the same litter, from four to nine months old, £5, Lord Wenlock; second, £2, Sir G. O. Wombwell, Bart., Newburgh Park.

Boars, large breed, under twelve months old, £3, W. Parker, Bradford; commended, J. Dyson.

Sows, large breed, under twelve months old, £3, W. B. Wainman.

Boars, small breed, under twelve months old, £3, Lord Wenlock; commended, Lord Wenlock.

Sows, small breed, under twelve months old, £3, Lord Wenlock; commended, Lord Wenlock.

HORSES.

JUDGES.

For Hunters and Hack.

T. Ellerby, Whitwell, Malton.
C. N. Nainby, Barnoldby, Grimsby.
J. Smith, Humburton, Boro'bridge.

For Coach and Cart Horses.

N. G. Barthropp, Hacheston, Wickham Market.
J. Hodgson, Bramper, Northallerton.
J. Johnson, Brigham, Driffield.

Thorough-bred stallions for hunters, £20, E. G. Simpson, Leven Bridge (Cavendish); second, £5, J. Stilborn, Yapham (Cawston); commended, Mrs. Holburn, Wolviston (Motley).

Stallions for coach horses, £10, R. Gill, Kelfield Grange (by Pottinger); second, £5, H. York, High Worsall (Yorkshire Lad).

Stallions for roadsters, £10, T. A. Jackson, Quarry Gap (Young Pretender); second, £5, F. Cook, Thixendale (Yorkshire Phenomenon).

Stallions for agricultural purposes, £10, J. Kirkham, South Stockton (Black Robin); second, £5, J. Goldborough, Maltby Stockton (Maltby Hero).

Mares and foals for hunting, £10, J. Batty, Bishop Monkton.

Mares and foals for coaching, W. and F. Coulson, Castle Howard; highly commended, W. Mothersill, Brookholme, and M. Robinson, Hauxwell; commended, R. Esby, Ormesby.

Roadster mares and foals, £10, F. Rickell, Watter; commended, P. Stevenson, Rainton.

Mares and foals for agricultural purposes, £10, W. Proude, Kirk Hammerton; highly commended, S. Thompson, Skipwith.

Three-year-old hunting geldings, £5, Sir G. O. Wombwell, Newburgh Park; highly commended, W. Brand, Salton; commended, T. J. Smith, The Bank, Northallerton.

Three-year-old hunting fillies, £5, T. B. Maynard, Marton-le-Moor.

Three-year-old coaching geldings, £5, R. Jackson, Ainderby.

Three-year-old coaching fillies, Mrs. Skilbeck, Swainby; highly commended, G. Hall, Ampleforth.

Three-year-old hackney fillies or geldings, £5, F. C. Matthews, Driffield.

Three-year-old geldings for agricultural purposes, £5, J. W. Pesse, Woodlands.

Three-year-old fillies for agricultural purposes, £5, Sir G. O. Wombwell, Bart.

Two-year-old hunting geldings or fillies, £3, D. Neaham, Haughton-le-Skerne; commended, J. Walton, Acklam.

Two-year-old coaching geldings or fillies, £3, J. Stephenson, Wheldrake; highly commended, T. Callender, Stockton-on-Tees.

Two-year-old agricultural geldings, £3, T. Elcoate, Elton.

Two-year-old agricultural fillies, £3, E. Lee, Stocksfield Hall, Newcastle-upon-Tyne.

Yearling hunting geldings or fillies, £3, J. Walton.

Yearling coaching geldings or fillies, £3, W. and F. Coulson.

Pairs of horses, of either sex, for agricultural purposes, worked during the season, £10, J. W. Pease.

Four-year-old hunting geldings or mares, £20, G. Holmes, Beverley; second, £5, W. H. Clark, Hook; highly commended, J. Hall, Scorbrough; commended, Sir G. O. Wombwell, Bart.

Special prizes given by Lord Wenlock, for the best five-year-old hunter, mare, or gelding, warranted sound, and to possess not less than three crosses of blood, £20, J. Musgrave, Poeklington (Overplus, by Augur); second, £5, J. B. Booth, Killerby, Catterick (Beechwood); commended, J. Hall, Scorbrough, Beverley (Blondin).

Special prizes given by Lord Londesborough for the best hunter, gelding or mare, six years old and upwards, £20, R. Botterill, Garton, Driffield (Enchantress); second, £5, H. Jewison, Raithorpe (First Whip).

Special prizes given by J. Dodds, Esq., of Stockton-on-

Tees, for the best hackney gelding or mare of any age, not less than 14 hands high, and qualified to carry 15 stones, a silver cup, value £20, P. Kirby, North Duffield; second, £5, W. H. Gaunt, Old Tharville.

Special prizes given by the Local Committee of South Stockton-on-Tees, for the best Cleveland bay stallion, £10, H. York, High Worsall, Yarm (Prince of Denmark); second, £5, J. Smith, Harleay Grange, Northallerton (Prime Minister).

Special prizes for the best Cleveland bay brood mare in foal or with foal at her foot, £10, C. Sourr, Hutton Bosville, Northallerton; second, £5, J. Featherstone, Stokesley; highly commended, T. Richenson, Seamer, Yarm.

Special prizes for the best three-year-old Cleveland bay filly, £5, R. Benton, Busby Grange, Northallerton; second, £3, R. Esby, Ormesby, Middlesbrough.

Special prizes for the best two-year-old Cleveland bay filly, £5, R. Benton; second, £3, W. Pickering, Egglecliffe, Yarm.

Special prizes for the best Cleveland bay entire colt, £5, G. Robinson, Marton, Middlesbrough; second, £3, R. Brecken, Norton, Stockton.

Silver medal to Master Dodds, Stockton-on-Tees (Donald), and Mrs. Hauxwell, Prospect House, Thirsk (by Dr. Sengrado).

WOOL.

JUDGES.—T. Clayton, South Stainley, Ripon.

Five hogg fleeces, £5, J. Wooler, Yarm.

SHORT WOOL.

Five hogg fleeces, £5, Lord Wenlock, Eserick Park, York.

FLAX.

JUDGES.—T. Clayton.

Specimen of green flax, not less than twenty stones, £5, J. Hodgson, East Lilling, York.

IMPLEMENTS.

JUDGES.—J. Almeck, Beverley.

R. Kays, Forcett Valley, Darlington.

E. Riley, South Dalton.

J. Wells, Booth Ferry, Howden.

STEAM CULTIVATION.

The best application of steam power to the cultivation of the soil, the prize of £80, J. Fowler, Leeds and Cornhill, London.

The best application of steam-power to the cultivation of the soil, suitable for small occupations, the engine not to exceed eight-horse power, and to be adapted to work the ordinary machinery on the farm, the prize of £50, J. Fowler.

The best cultivator or drag for more than two horses, £10, Coleman and Sons, Chalmersford; second, for two horses, £3, Coleman and Son.

Horse rakes, with clover drill attached, £2 10s., Spenser, Doncaster.

Fulverising plough, £2 10s., Hancock, Dudley Port.

Turnip cutters, £2 10s., Hornsby and Son, Grantham.

Root pulpers, £2 10s., Hornsby and Son.

Liquid manure carts and brass slide, £2 10s., the Trustees of W. Crookall, Beverley.

Wire strainer, £1, J. Rider, Leeds.

Cast-iron pumps, £1, Blinkhorn, Shuttleworth, and Co. Spalding.

Ventilators, £1, Fanny Chadwick, Bury.

Chain harrows, £1, W. C. Cambridge, Birstal, Leeds.

Improvement in plough wheels, £1, Hornsby and Son.

Plain rollers, £5, the Darlington Implement Company.

Clod-crushing rollers, £5, the Trustees of W. Crookall.

Grubbers for deep working between the ridges of green crops, £5 the Busby Implement Company.

Scufflers for working between the rows of green crops, £5, the Busby Implement Company.

Grass mowers, £10, Bamlett, Ripon; second, £5, H. Kearsley, Ripon. The class of mowers highly commended.

Potato sorter, £5, Mackinder and Co., of Lincoln.

Cooking apparatus and gas generator, £5, Oglesby, Dickinson, and Son, York.

Scarifier, £10, divided between Coleman of Chalmersford, and Clay of Wakefield.

The best implement for bringing weeds to the surface, £5, prize withheld.

BATH AND WEST OF ENGLAND SOCIETY.

A COUNCIL MEETING of this society was held at the Railway Hotel, Taunton, on Saturday, Aug. 1; present: Earl, Fortescue (in the chair), Sir J. T. B. Duckworth, Bart., Colonels Acland and Luttrell, Drs. Gillett and Brent, Rev. T. Philpotts; Messrs. Adair, Brembridge, Bruce, R. H. Bush, R. H. Clarke, J. Daw, R. R. M. Daw, J. T. Davy, Danger, M. Farrant, Dickinsen, R. Dymond, J. Fry, John Gray, Jonathan Gray, J. Gould, C. Gordon, J. Hancock, J. E. Knollys, M. King, H. G. Moysey, R. May, G. S. Poole, J. P. Pitts, P. P. Smith, J. Sillifant, J. W. Sillifant, E. U. Vidal, H. Williams, J. Widdicombe (director), H. St. J. Mank (secretary), Goodwin (editor), &c. &c.

The Secretary announced, for the information of those desiring the aid of the chemical professor, that Dr. Voelcker was leaving Cirencester that day, and his future address would be 101, Leadenhall Street, London, E. C.

Dr. Gillett brought up the quarterly report of the Finance Committee, recommending the payment of accounts amounting to £3,060 19s. 6½d.; he congratulated the society that, independently of the £1,000 due from the city of Bristol, the treasurer had sufficient funds in hand to meet all requirements.

The Stewards, Members of Committee, and other officers who were nominated at the last meeting of the Council, having expressed their willingness to act, were now formally appointed, viz. :—

Stewards of Stock: Messrs. G. Langdon, E. U. Vidal, and J. P. Pitts. Steward elect, Mr. J. Fry.

Stewards of Horses: Mr. C. Gordon and Colonel Luttrell.

Stewards of Implements: Messrs. John Gray and W.

Froude (yard), and J. E. Knollys and H. P. Jones (field).

Stewards of Poultry: Mr. S. Pitman and Dr. Brent.

Stewards of Horticulture: Mr. Jonathan Gray and Rev. T. Philpotts.

Stewards of the Arts Department: Dr. Scott, Messrs. H. Williams, J. Daw, and J. W. Sillifant. Honorary secretary, Mr. R. R. M. Daw.

Stewards of the Library: Messrs. Cotterell, Jonathan Gray, and Thompson.

Mr. Knollys reported that the authorities at Bristol were most anxious to render every assistance in their power to the Society; but owing to the great scarcity of arable land in the neighbourhood of the city, it would be necessary at the meeting next year to make a slight deviation from the ordinary arrangements, and he proposed to get up an exhibition of mowing machines, hay tedders, &c., on the grass land, and of steam ploughs and cultivators on the arable land at their disposal. On the motion of Mr. Jonathan Gray, seconded by Mr. Acland, the matter was directed to be left to Mr. Knollys' discretion.

A long and important discussion ensued, on the motion of Mr. Pitman, relative to the Society's place of meeting in 1865; but the further consideration of the subject was deferred till the October meeting.

On the motion of Mr. Pitman, seconded by Colonel Luttrell, a committee was appointed to consider whether it would be desirable and feasible to add a Dog show to the other attractions at the Bristol meeting. Mr. Pitman added that his desire was to make the dog show a pendant to the other departments, without rendering the Society responsible in event of failure. A committee was appointed, consisting of Messrs. Pitman, Luttrell, R. H. Bush, Knollys, Gordon, and Captain Adair.

Mr. Jonathan Gray, for Mr. H. Williams, moved that a sum of £100 be granted for providing suitable buildings for the display of articles in the arts and manufactures department, and it was ultimately resolved, on the suggestion of Mr. Acland (who was now occupying the chair in the place of Earl Fortescue), that a special report on the subject should be made by the Arts Committee at the October meeting.

THE STRAINE HORSE SHOW.—Mr. Gordon brought up a

report on the Exeter Spring Meeting, and announced that the horse Ratan, to whom was awarded the prize of £50, was certified to have covered no less than 107 mares during the season. It was thereupon moved that the prize be forthwith paid; and after some discussion as to whether the first-prize cart-horse (Model) was disqualified or not on the ground of age, it was resolved, that on the production of certificates that he had served the stipulated number of mares in the district, the prize of £30 should be paid to his owner. Incidental to the discussion, Mr. Acland drew attention to the very interesting character of the horse-show at the Worcester Meeting of the Royal Agricultural Society, and he ventured to throw out the hint that if the citizens of Bristol offered any local prizes, it could hardly be better applied than in encouraging an improvement in the breeding of horses in the West of England, whilst the presence of a number of good animals at the Bristol Meeting would greatly tend to add interest to the proceedings.

The Council then adjourned, after sitting upwards of three-and-a-half hours.

HARVEST TIME.

BY J. L. H.

I gaze across my whitening fields this glorious autumn day,
And see the wealth of golden grain o'er all the acres lay;
And while the serried grain-ranks fall before the reaper's
might,

I bless the Giver of the good, for a harvest free from blight.

Before me upon either hand, the well shorn meadows lie;
Beyond, the rustling barley beards are whitening 'neath
the sky;

While still beyond, the russet wheat hangs down its heavy
ear,

The guardian of the farmer's toil, the earnest of his cheer.

On that fair hill-side's gentle slope, and down the meeky
vale,

The feathery panicles of oats shake in the summer gale;
From yonder knolls where buckwheat blooms, and o'er the
fragrant pea,

Comes floating up the melodies of honey-gathering bee.

While fairest nymph of Ceres' train, of heat and moisture
born,

And loveliest of the summer's grain, I see the tasseled corn;
Adown the lawn in pastures green, or 'neath the shade trees
cool,

The gentle kine rest lazily, or stand within the pool.

The cradler, bending to his task, lays the rich harvest low,
While honest sweat-drops trickle down from off his sun-
burnt brow;

Then following on with rake in hands, the nimble binders
come,

Binding the sheaves in strawy bands, that wains may bear
them home.

Behind them still a happy train of merry blithesome boys,
Are gathering up the sheaves of grain with laugh and shout
and noise;

Soon, thickly set on every hand, appear the wheaten shocks,
In tented rows across the land spring up the barley cocks.

Up through the field, and past the bars, along the rutty
road,

The well-fed team come toiling on before their pond'rous
load;

And as I see my barns well filled from Heaven's bounteous
hand,

I bless the Giver of it all for the harvest through the land.

THE STEAM CULTIVATOR TRIALS AT WORCESTER.

SIR,—Now that the steam cultivator trials at Worcester are over, let us go quietly through them together, to see whether the prizes are awarded upon the terms upon which they were offered.

The prize of £50 for the best application of steam power which may be effectively and safely adapted for small occupiers was worked off first. The entries were Smith, Fowler, Howard, Coleman, Hayes, Savory, Stevens, and Turner, or rather C. Hall.

The first ground was half of it a wheat stubble in 1862, lying unmoved and well baked by the summer of 1863; the other half had been ploughed once, and planted with vetches in the autumn of 1862, and finished clearing off on the morning of trial, consequently it was not so dry and hard as the unmoved stubble of 1862. Hayes's, Smith's, Stevens's, and Savory's lots were fairly drawn on the hard-baked part; Howard, C. Hall, Fowler, and Coleman were consequently placed on the cool part.

Hayes, after working a Fowler cultivator for a short time, broke the cogs out of his drum to the extent of 15 inches. Smith went very steadily on, driving from a 3 feet 10-inch pulley on the fly wheel, and worked his engine under its nominal power of 45lb. pressure per inch, doing his work in a style for quality that could not be surpassed by anyone. His next-door neighbour, Mr. Stevens, had the misfortune to pull the times from his cultivator within a few yards of the start. Savory soon raced over his work, but too fast to leave good work behind him. Howard, with a good consumption of power, got through his light work pretty well; but not so Mr. Fowler, for he had the mishap of over-driving to the extent of blowing the plug out of his engine. Coleman got through very well; but C. Hall did not get to the scratch in time to fairly compete, but in time to show us that his link chain would take some three or four men some hours to screw it together for a 350-yard furrow and unscrew it again ready for a shift, the cost of which will for ever be a "lame leg" to his fancy chain.

Coleman, Fowler, Howard, Savory, and Smith were ordered to shift half a mile to another field. According to report Savory shifted and was ready for work in 30 minutes. Smith shifted and was fixed ready for a start in 60 minutes. Report says that Howard took 1 hour 50 minutes to shift and get ready for starting. I have no knowledge or anything to show the length of time Coleman took to shift; but report says that Fowler shifted with 3 men and 3 boys in 55 minutes. Who will believe that Fowler's three men and three boys loaded his windlass and anchor, and shifted them with the engine, plough and tackle, and placed all ready for work in so short a time? The fact is, they were not shifted and placed in that space of time; for, although they were shifted and some part of the apparatus placed on the Wednesday evening, the whole were not in place and in order for work until some part of the tackle had been put in place and in order for a start on Thursday morning. The time actually taken is unknown.

On Thursday the five competitors started about 10 o'clock. The greater part of the land was clover ley, with a bit of vetch land at the N.W. corner. The flat over which all the competitors had to cross was clover ley, with the lands running from east to west; the furrows were not very deep. The vetch land was quite as heavy in draught and made less agreeable work than the clover ley, although quite as well done.

Coleman's implement soon broke and put him out of court. Savory, after racing away at a fearful pace and breaking his rope once (not at all to be wondered at, his going at such a fearful pace over such hard-baked ground), soon finished his two acres. But how was it done? Why not half done. Then what is the good of racing.

Howard worked more steadily, yet hard to complete his plot in 1 hour 57½ minutes. The hill or flat part of his land was done much better than Savory's; but his furrows running from east to west were left unworked two yards in width from end to end.

Fowler made a rough job of it, stopping frequently, yet he

worked hard to complete his plot in 1 hour 57 minutes. The hill or flat part of his land was done very badly, numbers of pieces being jumped altogether. I have examined this the more particularly, Mr. Morton, of Streatley, near Reading, having told me that it was done well. The furrows running on from Fowler's plot were jumped, and done worse than Howard's.

Smith worked very steadily, working from his 3 feet 10 inch pulley, with a pressure on his 10-horse engine of never over 50lb. per inch, reducing the wear and tear of his tackle to the lowest point possible, and did his work well from end to end, even not excepting the furrows, which the rest of the competitors never did at all. Time, 2 hours 30 minutes, taken by the judges. Here is the opinion of some men who have, since the trial, inspected the work:

"Worcester, July 21, 1863.

"We beg to inform you that we have examined the four plots of land worked (as we are informed) by Fowler, Howard, Smith, and Savory, in competition for the prize of £50 offered for the best application for small occupiers, and report that No. 1 is well done—ridge and furrow, that Nos. 2, 3, and 4 are not so well done; No. 4 is the worst. The furrows through these three plots over which the implements crossed were, in the main, left unworked, therefore the ridge and furrow part of them must be done over again before they can surpass No. 1. The work done on No. 1 is in our opinion of more value than that done on Nos. 2, 3, and 4, especially the latter.

"No. 1 is the plot nearest the gate through which we passed into the field, and Nos. 2, 3, and 4 follow regularly after it. It may be well to state that we have no knowledge whatever as to whose machine did the several plots.

"T. B. DRING, Claxby, Spilby.

"J. WHITING, Stoke Goldington, Newport Pagnell.

"To Mr. Smith."

"Smith.

"Fowler.

"Worcester, July 22, 1863.

"We have examined the work done on Thursday, and report that No. 1 is by far the best, that No. 4 is the worst, and that Nos. 2, 3, and 4 have missed a good deal of the furrows. We numbered the plots from the gate going into the field. We entered the field without any knowledge by whom the work on the pieces were executed.

"W. TIBBITTS, Wrothall, Warwickshire.

"JOHN SELLKIRK, Manor House, Wrothall, Warwickshire.

"DAVID BURNETT, Ashley, Stockbridge, Hants."

Messrs. Dring and Whiting I know, but the three gentlemen supplying the last report are strangers to me. After receiving these reports, I took Mr. Lee, the Editor of *Bell's Weekly Messenger*, over the land. He, without any knowledge as to who did the several plots, made choice of the same as being the best and worst done. And, after him, several other strangers passed over the plots, reporting that the plot nearest the gate was the best, and the one furthest from it the worst done. One and all agree that the plot nearest the gate was the best, and the one furthest from the gate the worst done.

The judges have awarded £25 to the worst done, No. 4 the furthest from the gate; £15 to the best done, No. 1, nearest the gate; and £10 to Howard. The £25 must have been awarded to Fowler because he scratched over his piece at a few pence per acre cheaper than I did mine—disregarding quality altogether. To have given anything like the quality I did, he must have done all his work over again, when his cost would have been doubled, and much exceeding mine. To be sure, he did some ploughing and digging, that might to some extent weigh with the Judges; but to counterbalance that (although I will not turn twitch to the bottom and shelter the everlasting pest), I worked my combined machine in the same field, showing that ploughing and sowing can be done at one operation; besides, ploughs can be worked by my

tackle. Surely, then, my application, taking it all in all, must have been a better application than Fowler's. It is very simple and durable, and did not break through the trials; whereas, Fowler's did break, nine clips out of the drum, seven altogether. In fact the drum was completely smashed on Thursday. Then the prize of £50 ought all of it to have been awarded to me. It was offered in the singular number, and ought not to have been divided; as it is, the judges have made milk and water of it. I can understand why it was not awarded to Savory, although he did race the most quickly through his plot, his being two engines, clearly beyond the reach of a small occupier. Now, let us go on to Wadborough, and see about the gold medal and £50 for the best application of steam power for the cultivation of the soil.

The entries were Smith, Savory, Fowler (two sets), Howard, Coleman, and Stevens.

The first field was a good substantial job—dry and hard, a clean clover ley. The north side was the toughest as well as the roughest; the east end was rather of a lighter character, with a good deal of sand in it; and the west end was a tough, sticky clay, rather warm to work, as Mr. Smith the tenant called it. Coleman was fixed No. 1 on the north side, Smith next, then came Savory, Fowler, Howard, and last on the south Stevens.

Stevens made pretty good work by very steadily working; doing but little until Savory had raced over his plot, and then went to help him.

Savory soon dashed over his; done, or not done, or rather done after a fashion.

Coleman soon broke down, and was out of court.

Smith having worked on in his steady plodding way, using the least power of any, was the next to come out, leaving, as practical farmers told him, the best work in the field behind him.

Fowler started late with his fourteen-horse power engine, worked at double its nominal power. Came out next, leaving very passable work behind him.

Howard finished very soon after Fowler, leaving very middling work behind him.

Fowler then worked his double engine set, doing some digging that night, and finished his plot on Saturday morning; when Fowler with his two sets, Smith with his one, and Howard with his one, entered the tough rough stuff over the railway called land, and known eight years ago to have been as poor that the tenant did not think it worth cultivating, and therefore left it to run down of itself, where it has been lying ever since. The dry summer of this year has well baked it, and made it a capital test of power.

Fowler was the first to dash off with his 14-horse engine; but, mind you, very slowly. More than once I heard him wish for more power. The three-tined digger was the implement he used. The rough stuff was very troublesome, rolling back after the implement, filling the furrow so much that at one time I saw thirteen men employed lifting the huge lumps out. Upon my remarking it, Mr. Fowler said, "Never mind; I will get two men who can do it." He kept steadily on, and completed his work with one breakage of rope and some bolts,

&c. Altogether he got through well; but the grand question next was—What's to be done with the land? Mr. Torr, one of the Stewards, asked me. My reply was that it would be a waste of power to touch it again until after the dry suns of this summer, and a frosty winter had been over it.

Smith was the next to start, and got off at a depth of from four to seven inches; but could not fix. He did not go far before Fowler got a chance to laugh at him for choking. "Never mind," was the reply, "I do not care how I get through, so that I get through without a break." Laughing was the order of the day; while Smith got the times of his implement lowered, and the wheels properly adjusted to let the huge lumps pass through the implement; and much to the joy of the old fellow, he got through his tough job without a break, but not without a screw, by giving one of his beams a slight twist when he had about half done, which was the only mishap he had during the four days' hard work. But let me here tell you that, tough and rough as his job was, he could easily have got a seed bed on his plot for wheat next autumn; by passing a clod crusher over it and No. 3 again, the job would have been done.

Howard started next, and got on pretty well, by working two times in the unmoved ground, and one time in the worked ground, thus doing it over twice, as well as relieving his engine; but the day was not long enough for him to finish; his men left by the train about 8 o'clock.

Fowler, after finishing his first plot, then put in his two engine set with the digger, going straight down the lands; but the lumps fell in just as bad as when he went askew the lands in his first work. He then put on the grubber, and bang went his drum before he got to the bottom of the field the first time down.

Thus ended this memorable day's testing of implements against power, for doing practical work it was not. But how goes the prize? The Gold Medal and £30 to Fowler, and £30 to Savory. What! Chopped up again? Why Fowler's 14-horse engine was the master power; and, according to past understanding of the prizes, ought to have had not a sharing but all the prize. And if the judges saw merit in Savory's engine, they ought to have recommended a medal to him. It is not noble of so noble a society as the Royal Agricultural Society of England is, to stretch prizes from the singular to the plural number; and its officers should be careful how they tamper with the terms of its prizes.

In conclusion, I beg to state that the trial grounds at Worcester have been most excellent; and, without the Saturday's work, the Worcestershire people would not have believed that their tough stuff could have been handled at all; and that the field management has been quite as excellent, everything in place and in order, as well as fair play to all. I therefore beg to thank the field Stewards and Judges for their every attention. Although I cannot agree with the judgments and awards of the latter, yet I am willing to believe that it is a pardonable mistake. Thus ends the Worcester Meeting.

I am, sir, your obedient servant,

WILLIAM SMITH.

Woolston, Blitchley Station, Bucks, July 29.

THE TRIALS OF THE STEAM CULTIVATORS AT WORCESTER.

The Royal Agricultural Society again divided the implements of steam culture into two classes, giving the gold medal and £50 for "the best application of steam power to the cultivation of the soil," and another £50 to the lesser class for the system of steam cultivation most suitable "for small occupation." And it would be well to observe that this £100 and the gold medal were appropriated to *classes*, with power for the stewards and judges to divide and award the money among any number of machines, rather than give the whole to that one system which might be, all things taken into consideration, the best. With this remark, we at once dispose of the notion which had been entertained that it was not the intention of the society to break up and distribute the two fifty

pounds between the most deserving steam cultivators that were tested. Just as well might it be argued that the next prize on the list of £40 should have all gone in a lump to one firm, and not have been divided, as it was, among three most deserving fixed engines.

The judges of steam cultivators at Worcester allowed all the exhibitors a preliminary gallop before the real trial began, and each competitor was directed to exhibit his system of steam cultivation in any way he thought best. There are often mishaps in a long railway journey, and there are more frequently important alterations required in starting a set of tackle that cannot be nicely arranged after the severer tests have commenced. So this little rial heat seemed satisfactory alike to the exhibitors,

the public, and the officers of the society. In it Mr. Hayes unfortunately broke his very ingenious windlass, and could not enter for further competition. This steam break we fully noticed at Leeds, where it received a medal. A sudden strain and a wrong coil of the rope broke the flange off the drum; a mischief of so serious a nature that it could not be easily repaired. Mr. Steevens' new plough and grubber was likewise put *hors de combat* almost before it had started, but it was sufficiently restored to show the novel and excellent principle of its construction, and its capabilities for doing capital work. The judges rewarded the inventor with a medal, the engineering judge being especially pleased with the mechanism of the plough. In another plot of this experimental trial was almost the only chance of seeing the excellent work made by Coleman's steam scarifier. In the real trials the land was too stiff for the implements, and two serious breakages put this very useful application of steam cultivation clean out of court. An accident on the rail precluded Mr. Collinson Hall from at first exhibiting his new rope, but he got to work the following day. This rope, which is supposed by the ingenious inventor to "solve the steam problem," is composed of bars of iron 18 inches long, which are coupled together with flat links and strong rivets. The new rope does not claim the advantage of cheapness over that in common use, which is made of wire, and certainly the time that is lost in putting it together, altering the lengths, and taking it to pieces, must be serious drawbacks to its usefulness; and there is likewise a fearful amount of friction from the total absence of rope porters, which it appears part of Mr. Hall's system to dispense with.

We cannot leave these preliminary trials without noticing how easy it is for the best of workmen to neglect some portion of their duty. The driver of Fowler's engine did not happen to remark that the wheels of his engine were at one time standing in a deep furrow, and so allowed the water in the boiler to fall too low. The result was fortunately nothing more than the burning out of a fire-plug and springing a leak in most of the boiler tubes; but it shows how cautious and attentive engineers should be under all circumstances.

And now commenced the real trials for the prizes; the competition in this second class virtually lying between Fowler, Howard, and Smith. The price of Savory's two engines and apparatus (just £1000) could not be said to be in any way suitable for small occupations; and even supposing that great improbability to be realized, and the occupier of 800 acres of stiff arable land could lay his hand on that large sum of money, the cost of the cultivation by Savory's two engines is almost half as much again as with Fowler's small tackle. Yet here it must be noted that Fowler has made but little improvement in his smaller set since Leeds, save it be in the driving-band, and that it neither did better work nor at a less cost than at the great steam trials two years ago. The grubbing at Worcester was, on the whole, badly done; the surface was not sufficiently moved, and much of the land remained uncut. Fowler did this grubbing 7 inches deep with a 5-tine scarifier, at the rate of an acre an hour, driving his leaky engine at a pressure of 70 lbs. He burnt 8 tons 1 cwt. 2 qrs. of coals; and adopting the calculations of the Leeds trials, published in the Royal Agricultural Society's "Journal" of '61, this would work out at a trifle over 4s. per acre. In this calculation nothing is put down for removals, but the water is charged at 4s. per day, oil 1s., coals at 1s. per cwt., and interest, wear and tear, &c., at 17½ per cent.; which, we think, is rather too little, and we believe that 20 per cent. would be a safer calculation. But we are unwilling to disturb the basis that has been pretty generally adopted, and have applied the 17½ per cent. to all the different sets of tackle used at Worcester, spreading that yearly amount over 200 working days,

But to return to the trials. Howard stood next, and worked his 8-tine grubber, fitted with 18-inch broad shares, at an average depth of 7 inches, and made fair work, but did not stir the ground sufficiently, and missed some at almost every "bout." This work was performed in just the same time as Fowler's, with an expenditure of 8 cwt. 19 lbs. of coals. The land was grubbed quite as deeply, but the passage of the wheel of the scarifier over the stirred ground was considered a great drawback. The result of this trial, worked out by the Leeds table, would be within a trifle of 5s. per acre. Smith had by far the best plot in the field (which, by-the-by, did not properly belong to him, but he managed the judges so as to give him that ground which had been drawn by an absent competitor), for he had a clean bean stubble, which broke up much better than the tough clover-ley which fell to the lot of Fowler and Howard. There is no mistake that Smith's did some capital "smashing" with his 3-tine grubber; but as it was only fitted with 4-inch spud-points, and as the implement covered more than 2 feet, of course the land was not all clean-cut at the bottom. Going at a steady pace, with a consumption of nearly 4 cwt. of coals, Smith finished his two acres just within three hours. It was on passing over ridge and furrow that the Woolston grubber did much better work than the other competitors; but we think this a matter of no great moment, as ridges and furrows must soon cease where steam tillage is to hold its sway; and it would not be the customary plan to cross them at right angles, as that little bit happened to be worked at Worcester. And as to the supposed advantage which Smith gained over Howard on the removal and setting down of his tackle, there can be no doubt that Howard can master that operation quite as quickly as Smith, though at the trial we believe Smith was credited with half-an-hour less than Howard, which was owing to a stupid mistake of the surveyor on staking out the plots. Then, as to the cost of Smith's grubbing; it would be nearly 7s. an acre against Fowler's 4s., and Howard's 5s., and though the land was well broken and nicely laid, it was not all stirred, and, to complete the perfect cultivation of the field, the grubber would have to cross the work at some future period. This smashing was all Smith attempted to do, beyond showing his combined drill and cultivator, which may do very well on recently stirred or comparatively light land, but was no use on the hard soil at Worcester. Fowler and Howard were next set to work ploughing, and Savory too; but we purposely omit investigating the latter's performances, as we consider his engines too large for small occupations. The ploughing was not well done, and though in point of cost Fowler had a slight advantage, Howard's work was rather better laid, and he worked with a three-furrow plough against Fowler's four. This steam ploughing cost about 6s. 3d. per acre. Then came the digging, an operation in which Fowler had no competitor. This great feature in Fowler's system, which thoroughly moves and nicely mixes the soil, worked cheaply and well, and no doubt won Fowler the lion's share of the prize money. Half of the £30 fell to his lot in this small class, and the rest was shared by Smith and Howard, the Woolston veteran being placed over the great Bedford firm. "The reason why" the Judges' report, which will shortly be published in the Journal, may enlighten us; but, in the absence of any more definite information, we may venture to observe that had Howard's grubber broken and moved the surface of the land more thoroughly, we believe he would have stood in his old position of second only to Fowler.

Since writing the above we have read with regret, though not with much surprise, that the Messrs. Howard decline to accept the £10 prize the judges awarded them. Mr. Smith has made a similar protest, and thrown up his

portion of the prize money, having since respectfully returned to the president of the Society the cheque for £15 which had been forwarded to him. It is the old tale over and over again, of no competitor being satisfied with the award, save the winner of the first prize; and perhaps he may think he deserved the whole of the sum allotted to the class, instead of the large portion he received. However, there seems this difference in the two protests from Woolston and Bedford: the former was sent off in the fire and hurry of the moment, and the other has been written after taking much time for reflection, and well weighing the engineering results of the trials. It may be, on the part of the Messrs. Howard, the first move of a little bye-play of their own; yet we much regret that a firm which has always stood so well in the prize lists of the Royal Agricultural Society, and whose present position in steam cultivation is by no means an undignified or dishonourable one, should feel themselves called upon to question an award, which, by their own showing, has done and can do them no sort of harm with their customers or with the public.

Our remarks finished last week with the distribution of the prizes among the smaller tackle after the end of the trials on the Nunery Farm. The larger sets were now ordered off to Wadboro', and there was again the same number of competitors in an extensive field of summer-eaten seeds. The soil of this inclosure, which had evidently once contained many subdivisions, varied from a sandy loam on the top to a terribly stiff clay in the valley. It would be naturally expected that the light portion of the land would be moved deeper and stirred better than the stiff clay below; but throughout all our experiments of steam culture on variable soils, it has always been the tendency of the clay to *draw* is the implement on the lighter soils, and, on the contrary, there is an inclination to *rise* up, as if there was no solidity in the porous ground to keep the implement to its proper depth. This was observable at Wadboro' with all the competitors; whether Fowler dug or grubbed, whether Smith went slow or Savory ran fast, whether Steevens ploughed or Howard broad-shared the land, the work was done better and deeper in that tenacious clay than on the more friable loam at the upper end of the field.

In this large class—for the best application of steam-power to the cultivation of the soil—Fowler had it almost all his own way. Smith with indomitable perseverance ran a losing race with the best pluck and in the best of tempers. It was, in our opinion, wonderful what the small scarifier could do on such heavy land. It went through the clay slowly and steadily, and made some very fair work: the surface was pulled about, but the depth of the grubbing was irregular; neither was the land by a long way all cut. The cost of this "smashing" was rather less than on the lighter soil, and the entire operation was a very creditable piece of steam cultivation. Although these trials at Wadboro' were supposed to have nothing to do with determining the prizes in the smaller class; still, the cheap and admirable way in which Smith performed his work there, must have confirmed all the good impressions created in the judges' minds by the result of the previous trials, and doubtless was the turning point which placed Smith No. 2 on the prize list as the small farmers' steam friend. It must be confessed that Howard's grubbing at Wadboro' was the worst in the field, and that notwithstanding a great deal of it was done twice over. In the tender part of the field, the broadshares of the cultivator cut through the soil like a knife, without moving it at all, and allowed the grass on the surface to replant itself, so that in damp weather it would be ready to strike out again in the undisturbed soil. Fowler's grubbing with one engine was well done, especially at the stiff end of the field, for there great lumps of clay were torn-up and well tumbled over. With

his two engines, the cost of digging was a good bit over 9s. an acre; but the single engine thoroughly smashed-up the ground at a depth of 7 inches at a cost of 6s., which is a marvel of cheapness. And Savory, with his two ten-horse self-propelling engines, did some tolerable work, considering the pace at which the grubber was driven. This plot of nearly two acres was cultivated with a consumption of $5\frac{1}{2}$ cwt. of coal, and, calculating every expense, the cost would be something like 6s. 8d. an acre. But the great advantage of this system is, that it reduces the wear-and-tear of the rope to a *minimum*. Having the rope but once coiled round those great drums, there is no crushing, grinding, or clasp-action to wear it out, as in the other sets, and the ropes were paid out and wound-up with well-regulated exactness. Then, again, there is the celerity with which these engines can take up, move, and set down their tackle. The whole operation, including the removal from one field to another, was accomplished in less than half an hour, with only the usual staff of men, and without the aid of a *single horse*. And, lastly, there is the great facility for cultivating small and irregularly-shaped fields. It will be thus seen that Savory's system is, above all others, the most likely to be adopted by those who will let out steam cultivators; and the judges, taking this important feature into consideration, gave the Gloucester manufacturers 2-5ths of the prize money.

From the stiff land on one side of the West Midland Railway, the three great competitors—Fowler, Howard, and Smith—crossed the line to a field of the most obdurate and wretchedly tough clay that could be found. It had been upwards of eight years in grass, the tenant not thinking it worth the expense and trouble of further cultivation. In this dreadful clay, Fowler with his 14-horse engine showed what his digger could do. It had to go transversely over ridge and furrow, and so could not keep one uniform depth; but with an average of something like eight inches he dug up that obstinate clay, and flung the great masses of earth about in the most admired confusion. To very many timid agriculturists this operation was more wonderful than pleasing. It certainly was not the sort of cultivation we should recommend to be applied on old ley ground; but had the land been previously skimmed, and the grass destroyed, then this deep digging would have been the right and proper thing. Its cost was just 12s. per acre. Smith and Howard still stuck to their grubbing manfully, the former again making the cheapest and the best work. But it was evident that both engines and implements were over-taxed. Smith bent his tines; and Howard, to avoid being laid fast or breaking his implement, stirred about 3 feet in a bout, which is the real width he should cut at an end. Fowler started digging with his two engines up and down the furrows, but a mishap soon terminated that exhibition; not, however, till the judges had calculated the cost of this work at something like 20s. an acre.

A gold medal is the greatest honour that the Society can bestow, and there could be no doubt that Fowler was fairly entitled to that much-coveted distinction. To the same lucky man also fell £30 of the money-prize, so that Fowler has maintained the proud position he first won at Warwick, and again secured at Leeds two years ago.

It cannot be said that in those two years steam-cultivation has made any giant stride towards perfection. There may yet be numberless improvements that will simplify and cheapen the present systems of steam culture; but it would be foolish for the heavy-land farmer to wait for those amendments, and it would be rank madness to put off the introduction of the steam-plough till those wonderful dreams and bright visions of "Talpa," and other clever theorists, shall be realised. Generations may pass away before any such conquests and revolutions are

made in mechanical science, and though the application of steam-power to the cultivation of the soil may be yet in its *infancy*, it certainly now *runs alone*, and moreover

presents the only means by which the occupiers of clay soils in these kingdoms can ever hope to compete successfully against the corn-growing nations of the whole world.

THE OLD NORFOLK FARMER AT WORCESTER.

SIR,—The meeting of the Royal Agricultural Society at Worcester was too tempting an occasion for me not to avail myself of it; and having, besides, some business to transact there, I took the train on the 14th July, and about six o'clock found myself at the station at Worcester. Before, however, I give you my ideas of the show, allow me to state what I saw in passing through the rich country between London and Worcester.

I found the crops of wheat and oats on the London side of Reading nearly ready for the sickle, and a finer prospect of an abundant harvest never met my eyes. This remark applies as well to all kinds of grain, on the whole of my route, as to wheat; and I particularly observed that I never saw so little corn laid as on this journey. Not a field was prostrate, or even shackled, and it seemed to promise a good turn for the reaper as well as the farmer. Alas! a few days later, and the prospect in this respect, at least, was blighted.

After passing Reading, I found the corn generally more backward, and some of the wheats were quite green. A good deal of hay, also, was either still standing, or lying on the swathe, and I was surprised to see the crops so heavy as many of them were. The quality, too, was excellent, and its perfume was quite a treat to one just emancipated from the noisome smells of the metropolis, especially that gratuitous, nauseous, artificial—Stop! let us consider. I feel I am upon ticklish ground; but it must out, for I am determined on all proper occasions to lift up my pen against a nuisance which has become all but universal. I refer, then, to the habit of smoking in the streets of London and other places. You cannot take a walk in any part, but you have a pipe or two before, behind, and on each side of you! It has become, not merely a fashion, but a *passion* of late years; to the great annoyance of the ladies, as well as those gentlemen who still desire to keep themselves fit for decent female company. Inevitable smells we must put up with, and they are not so prevalent as to form a general nuisance; but to be constantly compelled to breathe the foul atmosphere of tobacco-smoke is atrocious!

I am glad to find that the upper ten thousand are abandoning the practice with disgust at its prevalence; and if they repudiate the pipe or cigar, we may hope the reformation will soon descend to the middle ranks of society, and thus the practice will be confined, as it ought to be, to the lowest class.

But what, it will be said, has this question to do with my journey to Worcester? A great deal, my friend. You will now be able to understand to what an extent I appreciated my emancipation from the nuisances of the metropolis, and the exchange to the sweet perfume of the new-made hay. The country, too, along the route is exceedingly beautiful. Hill and dale, woods, and rich cultivated fields and meadows, meet the eye in quick succession. The classic vicinity of Oxford, "where winds the silver Thames along," the bold hills of the Cotswold district, the beautiful vale of Evesham, with its "soft-flowing Avon;" and then the Malvern Hills in the distance, bounding the prospect with their picturesque outline; altogether presenting a scene quite new to one who has been chiefly accustomed to the tame and flat features of the eastern counties.

I did not, however, see in my route generally those indications of high cultivation which we find in Norfolk and

Suffolk; and I was horrified at seeing two strong horses in a plough, and *three more to draw them along*; in short, five good horses at full length performing what any Norfolk or Suffolk farmer would accomplish with two of the Suffolk punches. It is true, the land around Worcester is a rather strong clay, and it was very dry and hard at the time of my visit. But I found that four or five horses are usually yoked to a plough, without respect to the condition of the land, and from this circumstance I came to the conclusion that agriculture is very much in the rear in the march of improvement, in Worcestershire. Five horses to a plough to turn over five or six inches of the soil! I should as soon have expected to see them yoked by the tail—the good old practice in Ireland in the days of Charles II.

The crops of turnips and mangolds were much finer throughout the route than I had expected to see them, considering the long drought we have had. I believe they were chiefly sown after the rains in June, but have made great progress since. It is only on the dry hilly grounds that I saw a deficiency of plant, and in some cases the ground was completely covered, giving a good prospect of plenty of cattle-food for next winter. With regard to the harvest, I should think that it will not be generally commenced in Worcestershire before next week, although some fields of oats, and a few of wheat, may now be cut. This, however, will not make it a *late* harvest, as fine weather, which we have reason to look for, will enable the farmers to house their wheats for the most part in August. The crops are very heavy round Worcester, and the reaping machine has not found its way into many of the home-steads, so that the time will be protracted by the more tedious, onerous, and expensive employment of the sickle and the scythe. Agricultural improvement, like that of the church, is slow.

The morning after my arrival at Worcester I visited the trial-yard and the show-ground, and was much delighted with the ample and excellent preparations that had been made. The site itself was the best adapted to the purpose of any the "Royal" has ever before had, being in extent between forty and fifty acres, on a gentle declivity at the foot of a considerable hill, which overlooks the whole scene, and was almost constantly crowded with spectators. It was impossible for better arrangements to be made for the accommodation, either of the exhibitors or visitors, with one single exception, namely, the horse-boxes, which were most inconveniently small and dark, making it impossible for any one properly to examine the animals. It will be said that they were shown in the spacious ring in which they were exercised, and brought out for the examination of the judges; and this is true enough, but every one who wished to examine a horse could not always be upon the spot; and if they were, they were not allowed to enter the ring. If, therefore, any person desired to purchase a particular horse, he had no opportunity to inspect him except the superficial one of seeing him exercised round the ring. I heard many complaints of this, but it was the only one, and in all other respects the arrangements of the ground, I believe, gave entire satisfaction to every one.

I am not going to give you any account of the 5,839 specimens of implements and machines exhibited at Worcester, or of the multitude of animals congregated to-

gether there, but rather my impressions of the progress that has been made in the construction and use of the first, and the improvements effected in breeding and rearing the second. It appears to me that the machinists have now brought their implements and machinery to such an *equality of perfection*—with one exception, by-the-bye, which I shall presently take notice of—that any superiority of one over the others in the competitive trials depends more upon some accidental circumstance than a really important difference in the construction. This was manifest to me in the trials of the thrashing-machines, which I paid particular attention to. The test was the time it took to thresh a given number of sheaves; and it appeared to me that those machines which had the brikest fellows to tend them, and who could shove the sheaves the quickest through the beaters, bore away the bell. The speed, too, of the steam-engine had much to do with that of the machine, and a slight increase in the one would accelerate the other. I say, this was my impression; but the judges may have had a more occult mode of determining the respective merits of the machines, and I am certain they acted with the greatest impartiality as well as patience in getting through the large number of machines offered for competition.

Of the steam engines I give no opinion. Dynamics were not in fashion in my young days, and I am now too old to begin to learn them, even if I had time. But I can say thus far, that more perfect or beautiful works of mechanical art than some of those exhibited it is impossible to conceive. Tuxford's portable engines, for instance, with their beautiful mechanism enclosed compactly within what may be termed their own bowels, appeared to me the most perfect specimens of mechanical skill I ever witnessed.

But the trials of the steam ploughs and cultivators possessed the greatest interest for me, and, as forming the exception to which I have just referred, demands an explanation. I attended the working of the several implements on four mornings; and the results, taken altogether, confirmed me in the opinion you are aware I have long entertained—that the present mode of cultivating by steam is but the imperfect precursor of a system that will bring what the late Stephenson called "the man and his wife," namely, the rail and the steam engine together on the farm. The time is approaching when the position of Agriculture will necessitate a large reduction in the labour of the farm. The foreign competition in the grain market has arrived at such a height that the more deficient the crop is with us, the larger will be the importation, and, consequently, the lower the price. The experience of last season must convince any reflecting person of the truth of this assertion. With a deficiency of six million quarters in the crop, and an annual demand for an equal quantity to make up the average consumption, we imported 11½ million quarters, and had a drooping market the whole year. And such, in all probability, will in future be the case; so that a low price of wheat will be the normal feature of the trade.

Now, with the present system of steam culture, no material reduction can be made in the expense of tillage, because it involves *only one* of the operations of husbandry; whereas steam is as capable of performing *all* the operations on the farm as it is in the manufactory or on the railroad; and it is to this object the machinists as well as the landowners must direct their serious and sedulous attention. It is, besides, to this *ultimatum* that things are actually tending; otherwise, what is meant by that pile of rails for agricultural purposes fixed to their longitudinal sleepers, which I saw at the stand of A. and E. Crosskill, Beverley? If they begin to lay down rails in the yards and on the roads for the conveyance of produce and manure, it will but be the beginning of the end;

and my prediction, so often repeated, that the present mode of steam culture is but a temporary expedient to introduce a more complete system that will embrace every operation in husbandry, is not so far from accomplishment as some of my friends suppose.

The trial-yard at the Worcester meeting presented a scene which no one could look upon without wonder and admiration. And to one who, like myself, can look back to the last century, when so intelligent an agriculturist as Hunter, the author of the "*Georgical Essays*," considered that Cook's drilling-machine was "*so expensive that it would never get into general use*," it would be impossible to avoid contrasting the two periods in order to judge of the amazing progress that agriculture has made in the interval. It appears as if a really golden age for the husbandman is approaching. Not that mawkish, sentimental sort of dreamy enjoyment, which pictures shepherds and shepherdesses billing and cooing together, as if there was nothing in life to do but making love; but when the more laborious employments of the farm will be performed by machinery, and the physical powers of the husbandman, untaxed by the most exhausting, and therefore degrading duties, will be devoted to employments more elevating to their intellectual faculties—the superintendence of those very machines which have thus emancipated them. It is impossible that familiarity with these works of mechanical art should not produce a beneficial effect upon the minds of those who have the management of them, by elevating them above the grovelling ideas to which they were formerly bound. Nor is it a less important fact that the use of machinery will necessitate the education of the rural peasantry, in order to qualify them for the task. This is already tacitly admitted by the agriculturists, who, in many parts of the country, are making arrangements for that purpose. Assuredly the next generation of agricultural labourers will be as superior to the straw-yard savages of the last century as the present race of farmers is to that of the same period; in fact, they have grown together in intelligence, although the progress of the servant, for obvious reasons, has been slower than that of the master.

It was an unfortunate circumstance that the corn was not forward enough to employ the reaping and mowing machines, whilst the hay was all cleared from the fields. These most useful auxiliaries to harvest-work are getting extensively into use; and, as some of the machinists are constructing small one-horse machines for small farmers, it is probable that in a few years there will be no farm without one. The work is performed so much better and quicker by them than by hand with the scythe and sickle, that no farmer who can spare the money will be without one. Money! aye, there's the rub! Where is all the money to come from, to purchase all those expensive implements I saw at Worcester? Yet, they *are* purchased, or they would not be made; and if the makers did not succeed, their numbers would not increase so rapidly. According to your leading article this week, the exhibitors have increased from 212 in 1860 to 830 in 1868. This must be because the business of a machinist is a prosperous one; and the machines are made because the farmers find it to their interest to purchase them, and also because they can spare the money. This latter fact is as satisfactory as it is undeniable, and proves that the resources of the agriculturist do not all lie in the grain crop. Last year would have been ruinous if that had been so; but the high price of animal produce and of barley made up the deficiency in the yield and price of wheat—at least, so far as to prevent the grower from sinking under it, which would have been the case a few years since. We live in more hopeful times, when the farmer has many resources besides his wheat crop to depend on. High farming and mixed husbandry have done wonders for

him, and the introduction of science into agriculture, while it has increased the amount of capital required, has more than doubled the profits of farming.

Brick-making machines turning out from 20,000 to 30,000 bricks per day, the two or three attendants having but little more to do than to look at the perfect manner in which the clay is worked, and ejected in the required form! saw-mills that rush through a piece of timber with an ease and expedition perfectly marvellous! thrashing-machines that beat out the corn, riddle, dress, and put it into sacks clean and weighed, ready to send to the mill, the straw also being safely stacked; and all this with scarcely the intervention of any hand labour except to feed the machine and remove the grain sacks! Leviathan machines of mammoth proportions roaming round a small circle, but ready at a moment's warning to draw from one to any number of loaded waggons to any distance, give him but a feed of coals and a drink of water now and then to keep up his physical strength! I could not but compare this machine, peacefully drawing two waggon-loads of country lads and lasses, with the quiet and equally dignified elephant at the Zoological Gardens in the Regent's Park, with a whole bevy of delighted children on his spacious back! Nor are the wants of the farmer's wives (if I may be allowed so homely and old-fashioned a term) forgotten in the *mêlée* of machinery. Washing machines that save the hands and arms of the housemaids, and wring and mangle, and almost dry the linen submitted to them! No: there's Mr. Child's drying machine, on which the linen being hung, it revolves by the wind and soon prepares them for the ironing box; and if rain comes, the whole can be shut up like an umbrella, and taken into the house. Churns of every description and form. And then there is Mr. Hancock's butter-making machine for divesting the butter of the buttermilk without its being handled with the dairymaid's hot hand. This machine is getting into general use. Descending from the sublime to the ridiculous, I was greatly amused on examining a machine (save the mark!) for paring apples, taking out the cores and cutting them into slices for a pie or pudding by *one operation*! What next? Why a magnetic hammer, that takes up iron tacks and nails by the head and drives them into whatever you wish without endangering your fingers! And what is that noisy fellow after? Oh, he is selling by private auction knife-sharpeners at eighteenpence each. He insinuates that he is the only honest man in the trade, because others shew you one thing, and, if you buy, deliver another that is worthless, which he never does. I took him at his word and bought one, and must acknowledge that I don't repent of it.

Such are some of the items of this wonderful Show, which has never been exceeded, if it has been equalled. Now let me take a turn amongst the live stock; and first the horses, amongst which there were some as fine animals as I ever saw. It was a sight worth going many miles to witness, when they were taken out of their dark and narrow hutches to be exercised in the spacious ring. Oh, how they seemed to enjoy the fresh air above and the green-sward under their feet! Some of the thoroughbred horses and hunters were perfect specimens of symmetry and strength, of which they seemed to be as perfectly conscious. Some of them were very demons of fun and mischief, and made the spectators fly right and left, to avoid an unpleasant acquaintance with their heels. I was pleased to see so many ladies in constant attendance at the ring where they were accommodated with chairs, which in such hot weather were much needed. I did not think the show of cart-horses so good as usual, although there were a few fine specimens. The Suffolk chesnuts were absent, and they generally constitute the most

meritorious portion of that class of horses. I believe, too, that the show of these animals upon the whole rather disappointed the amateurs as well as the dealers. Yet, there was great pleasure experienced as one after another fine animal was led out by the groom, who had perfect command of his Bucephalus, and could check his exuberant spirits with a word.

As usual, amongst the cattle the Shorthorns were the most numerous. Generally speaking I thought they were not so good as usual. They were not generally so fat; and, although this is as it should be, it detracted much from the appearance of the Shorthorns, which are nothing, in my opinion, unless they are fat. The fact is, and I must acknowledge it, they are no favourites of mine. I have tried hard to like them; but as soon as they come in contact with the Devons and Herefords, they sink at once, in my estimation, to an ignoble race—the very plebeians of the byre and pasture. I do not deny the merit of a Master Butterfly any more than of some of our own species risen from the ranks (more power to them!). But there they are—a coarse-haired, raw-boned-looking breed when lean, and a huge mountain of ordinary beef when fat. Give me a slice off the ribs of a Galloway or Highland Scot, or a moderately fattened Devon steer, and you may praise your Shorthorns to the antipodes, where Master Butterfly went to die. After all, the Devons and Herefords are the aristocracy of the bovine species, the Scots are the middle class, and the Shorthorns represent the masses.

What shall I say of the sheep and pigs? Both were well represented; but here again I have my predilections, for I don't like any breed of sheep so well as the South-downs, nor is there any English mutton equal to theirs. The Leicesters and the Cotswolds are fine animals, and produce a large amount of wool and mutton. But you may feed at least three Southdowns at as little expense as two Cotswolds, so that I question whether the farmers are not better off in the long run, with a flock of Downs than with one of either Cotswolds or Leicesters. Long-wool certainly sells high, and the two named breeds produce heavy fleeces. However, every race has its own admirers, and I am not so fastidious as to deny the merits of these two; but I love good mutton above all things.

Well, the pigs were pigs, and kept up their character. Two pens of these unclean animals attracted more notice, I think, than all the rest. Two enormous mother-pigs, one having ten and the other *fourteen* pigganinies, all of them tugging away at their poor old mothers, who bore it patiently enough, except that they kept uttering a querulous kind of whine while they were pulling them to pieces. For shame, you great lubberly leeches! you ought to have been weaned a month ago. Such was my opinion of them, for they weighed at least two stones each, 14lbs. to the stone. Some of the black pigs were very handsome, and obtained great admiration. Times are altered since the Board of Agriculture rejected a pen of pigs from competition because they had a black behind. It is said that in Florida nothing but black pigs will live. There is a herb grows there which these eat with impunity; but if a white pig eats it, he loses his hoofs and pines away. This is a curious physiological fact, with which I must close my remarks of the show.

I returned to London by way of Hereford, and on passing through the fine country between that city and London saw enough of the effects of the storm of the 31st to make a farmer's heart ache: not a field of wheat or barley but was beaten down—some as flat as if a heavy roller had been passed over them. Fortunately the wheat was too forward for the grain to suffer much injury from it, but it will make terrible work for the reapers.—Yours, &c.,

THE OLD NORFOLK FARMER.

THE THIRD BATTLE AT WORCESTER.

A LAY FOR THE AGRICULTURISTS.

1.
With "faithful" cider drinkers, adown the bannered way,
I sought the plain where Royalists stood in July array;
"Hoof and Harrow" is the watchword, in lieu of "Church
and King,"
Worcester has known no punder sight since Langan met Tom
Spring.

2.
LORD EVERSLY and BRANDERTH GIBBS were F.M.'s in
command;
While PAINE, and DENE, and MILWARD held their own bri-
gades in hand,
Dashing upon blood ponies, east and west and everywhere,
And halting 'mid their labours for a laughoon with the Mayor.

3.
TOM with his purple badges proved the BOYLE BOOHN bird
a dunce,
By entering an appearance in places three at once,
Committee—Implements—Finance: then scaling a sheep pen,
With the concentrated energies of half a score of men.

4.
I saw the "racing engines," the washing machines, and roots,
JUDGE UNTHANK with his light cigar and long judicial
boots;
LADY EMILY FIGOT noting the stock all round,
And patting the three "darlings" which had won her forty
pound.

5.
I watched the "Sherthorn Nestor" with a meal tub for his
throne,
And a glance like to a falcon's, balance flesh, and hair, and
bone;
Oh! those eight grand in-calf heifers! Oh! that doltly-
handled cord
In the 'cute strategic movements of CUDDY and JOHN
WARD!

6.
TALLANT's head is seen no longer, DOUGLAS sends no
Queen of Rose,
But a *Flower girl* strewn glory upon Scotland and "Montrose";
Though GUNTER's *Duchesses* prefer the pleasant vales of
Wharfe,
BATES' blood has still a flyer, and "it proved an Essex calf."

7.
Hats off for *Queen of the Ocean*! Joe's Blondin wears no
willow,
"A family thrashing" from Thorney Holme is not a thorn in
his pillow;
JOE was six times, and *Fred's Farewell* "took just a rum
'an to beat her"—
Ain't STRAFFORD sweet on HEGAN's and eloquent on
Pretor?

8.
There's DUCKHAM deep in "the numbers" of white face and
mottle lore,
The chronicler of *Sovereign*, *Sir David*, and *Cotmore* :—
Hail to the bulls by *Sir Benjamin*, but sad's the REA
bulletin;
Now for a chat with MONKHOUSE near his "SAM" and
Clementine.

9.
Well may the sightless veteran o'er his "growthy lass" wax
merry,
He has beat victorious ROBERTS, and polished off old
PERRY :—
If QUARTLY and JIM DAVY shirk the Devon battle brunt,
We've a *Royal Rose of Denmark* and *Prince Alfred* in the front.

10.
Choice morsels are the Southdowns, and ye BARON WAL-
SINGHAM
With WEBB's JOHN DAY to train them, has well nigh
"skinned the lamb :"
COLONEL INGH has vanquished SANDAY, for the 'shearling
eyes and tup,
But "GROGHE" observes, "The only our own blood cropping
up."

11.
BARFORD takes up his parable on BAKWELL and "Shear
'em fair!"
And clasps the hand of HOWARD, for sending his ewe-pen
bays :
With Oxford memories in his head and magisterial frown,
He steps round to the Cotswolds for a word with Mr.
BROWNS.

12.
Fig classes! CRISP and WAINMAN, HEWER, SEXTON—
the old story—
A boar called *Macaroni*, and a sow—sweet *Annie Laurie* ;
If there be a sight Leeds dodgers and their pigs don't under-
stand,
It is PROFESSOR SIMONDS with the "mouth screw" in his
hand.

13.
And eke a learned Baron near "The Hundred Pound" domain,
Had a look at *Master Martin*, and didn't look again :
As I scanned the hunter sires in the ring and in the shed,
I pondered much within myself how full a third were bred.

14.
Neville was "hung upon wires," Tom Sayers went in with a
seat,
But as for the groom squad's going, decidedly bad was best ;
With TRIDDINGTON's daughter behind him, BOOTH's cup of
triumph's full.
There TOM BROOKS stands in ecstasy with BARTHOPE,
o'er *John Bull*!

15.
From this field of peaceful warfare, may there spring rich
"battle sheaves,"
A grander stamp of hunters, better bacon, rarer "theeves,"
Steers that will more than satisfy, with "breaches," back, and
chine,
The wary eye of BUFTON and the shade of CARWARDINE.
—Punch.

THORNE AGRICULTURAL ASSOCIATION.

PRESENTATION TO MR. JOSEPH RICHARDSON,
THE HONORARY SECRETARY.

The members and supporters of the Thorne Agricul-
tural Association recently paid a most deserved compliment to
Mr. Joseph Richardson, of Thorne, the honorary secretary,
who has efficiently and courteously discharged the duties of
that office, by presenting him with a magnificent tea and
coffee service, weighing 352 ounces, in recognition of
the ability he has displayed, and the great aid at all times rendered
by him to the competitors at the various exhibitions.

The presentation took place in a large room on the premises
of the White Hart Inn, Thorne, when about forty-five gentle-
men sat down to a most sumptuous dinner. The room was
decorated for the occasion; and scarlet cloth hung round
added to its appearance.

The silver services were arranged on the table immediately
in front of the chairman, and at the same time Mr. Richardson
received a lithographed copy of the names of the subscribers
to the testimonial fund. The tray bore the following inscrip-
tion :—

"This Tray, and a Tea and Coffee Service (value 130
guineas), were presented to Mr. Joseph Richardson, of Thorne,
by upwards of 150 of his friends and admirers, as a mark of
their appreciation of his valuable services, as Honorary Secre-
tary, for several years, to the Thorne Agricultural Society, at
a dinner given to him at the White Hart Hotel, Thorne, on
the 28th July, 1863; Makin Durham, Esq., in the chair.

"E. T. WHALLEY, } Honorary Secretaries to
"R. J. COULMAN, } the Testimonial Fund.
"J. BROWN, Treasurer."

The usual speeches were made after the complimentary
toasts, and a most pleasant evening was passed by a highly
respectable and influential company.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL, Wednesday, August 5.—Present, Lord Feversham, President, in the Chair; Lord Tredegar, Lord Walsingham, Major-General the Hon. A. N. Hood, Mr. Amos, Mr. Raymond Barker, Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Druce, Mr. Exall, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Randell, Mr. Robert Smith, Mr. Wallis, Mr. Wells, Professor Wilson, Mr. Frere, Professor Simonds, Professor Voelcker, and Mr. Geo. Wood.

FINANCES.—The Hon. Major-General Hood presented the report, from which it appeared that the Secretary's receipts during the past month had been examined and found correct. The balance in the hands of the bankers on the 31st of July was £7,568 11s. 8d. Cheques were recommended to be drawn for the Stock and Implement prizes at the Worcester meeting, amounting to £2,500, and for the expenses attendant on the Show, which would render it necessary that the £2,000 on deposit at the London and Westminster Bank be withdrawn. This report was adopted.

JOURNAL.—Mr. Owen Wallis presented the list of subjects, for which the Committee recommended that premiums should be offered in 1864, which was agreed to:—

- | | |
|---|-----|
| 1. Hertfordshire | £50 |
| 2. Suburban Farm | 25 |
| (offered by Sir C. Domville). | |
| 3. Construction of Cheese Rooms | 10 |
| (suggested by the Hon. A. Vernon). | |
| 4. Peculiar qualities which render pastures especially adapted for the production of butter and cheese respectively | 10 |
| (suggested by Colonel Kingscote). | |
| 5. The comparative value of Linseed, Cotton, and Rape cakes for feeding purposes | 10 |
| 6. The best mode of storing Turnips, Mangel, Potatoes, and Carrots | 10 |
| 7. The best mode of breaking up Grass, and its subsequent management | 20 |
| 8. Any other agricultural subject | 10 |

IMPLEMENT.—Colonel Challoner, Chairman, reported that the Committee, after careful consideration of the triennial system of 1856, and the quadrennial system of 1858, recommended a triennial system according to the following classification:—

SPECIAL PRIZE FOR STEAM CULTIVATION.

1864.—I. IMPLEMENTS AND MACHINERY FOR THE

DRAINAGE, TILLAGE, AND CULTIVATION OF LAND.—Tile and brick machines, draining implements, grubbers, ploughs, cultivators, clod crushers, rollers, harrows.

1865.—II. IMPLEMENTS AND MACHINERY FOR THE

CULTIVATION AND HARVESTING OF CROPS.—Drills and distributors, horse hoes, mowing machines, reaping machines, haymaking machines, horse rakes, carts and waggons.

1866.—III. IMPLEMENTS AND MACHINERY FOR THE

PREPARATION OF CROPS FOR MARKET AND FOR FEEDING STOCK.—Steam engines, threshing machines, dressing machines, mills and crushers, chaff cutters, cake breakers, root cutters and pulpers, dairy implements.

This report was adopted.

The report of the Stewards of Stock exhibited at Worcester was read, and it was agreed that it be referred

to the Veterinary Committee to draw up some more stringent rules for exhibitors in the Pig Classes.

On the motion of Mr. Robert Smith, seconded by Professor Wilson, a Committee, consisting of the Hon. Major-General Hood, Mr. Clayden, Mr. Fisher Hobbs, Mr. Holland, M.P., Mr. Randell, Mr. Torr, and Mr. Owen Wallis, with the Stewards and the mover and seconder, were appointed to frame regulations relative to the clipping and preparing sheep for show.

On the motion of Mr. Raymond Barker, seconded by Lord Tredegar, the usual leave of absence was granted to the Secretary, and the Council then adjourned over the autumn recess to Wednesday, the 4th of November.

THE IMPLEMENT STANDS AT WORCESTER.

(Concluded from our last.)

Our remaining stroll through the array of farm tools and machinery commences with the stand of Messrs. Greening and Co., comprising all varieties of hare, rabbit, sheep, and ox-proof wire-fence, galvanized netting, iron farm-gates, "unclimbable hurdles," tree-guards, and so on.

Messrs. J. AND F. HOWARD had a very extensive show of the implements which do credit to the skill of the workmen in the Britannia Works at Bedford. In addition to the steam plough, the harrows and grubbers, arranged with steering apparatus for steam work, this stand comprised all forms of the champion plough, ploughshares, the potato-raising plough which repays its cost in a couple of days by dispensing with hand-forkers, a new plough made with gallews and screwed-wheel gear (a substitute for the Norfolk and Hampshire gallews), harrows of many sises and patterns, horse-rakes, and the improved haymaking machine which carried off the prize at the Leeds meeting.

Messrs. PICKSLEY, SIMS, & Co. showed, among a large assortment of implements and machinery, their reaper and new mowing machine, which possesses a novel contrivance for relieving the crank-pins of the connecting-rod from weight.

On the large stand of Messrs. BARNARD & BISHOP was Dr. Ager's rotary forking or digging machine—probably the best form in which this old idea has yet been presented to us. One set of rowels tear up the soil, while another set revolving behind clears the teeth of the first set.

Messrs. BELL & HALL had the largest stand of implements and machines, including all the specialties of our best makers.

The Trustees of W. CROSSKILL had a grand show of their machine-made carts, waggons, wheels, all of most superior workmanship, and sold at easy prices for the farmer. Their Bell's reaper, with self-delivery, is an extraordinary machine for accomplishing a very large acreage per day, taking, as it does, a clear cut of 8½ feet breadth. The portable farm railway, of 2½ feet gauge, in 15 feet lengths, is exceedingly valuable for claying and marling land, and for carting off roots, &c., upon wet clay fields. Probably, some combination of the portable with portions of fixed railway (as along headlands, &c.) may be adapted before long, to assist in the manuring, harvesting, and the general carriage-work of the farm, now that one-third or one-half the teams are being banished by the steam-plough.

Mr. J. GRANT's portable farm-railway is one of the chief novelties of the show. Instead of being constructed in por-

tions of frame-work, as in Messrs. Crosskill's well-known and more substantial railway, the longitudinal sleepers (with angle-iron rails upon them), are in separate 16½ feet lengths, fitting end to end by tongues and sockets; while the gauge is regulated not by cross-sleepers but by iron tie-bars, the shifting of the pieces being an amazingly light and easy operation; sidings, crossings, turn-tables are provided of the simplest and lightest character; and the barrow trucks, tipping trucks, &c., all present great facilities for quick and ready manipulation. The same lengths of rail serve for any required gauge. The whole is designed for manual labour, in leading-off roots or spreading manure upon wet land; the inventor maintains that the cost is less than that of ordinary carting, while the injury to the land (often so great a drawback in clay farming) is altogether avoided. For claying, washing, chalking, and so on, the portable railway must be a great acquisition. It remains to be seen whether this invention is not a step toward the harvesting of corn either without the aid of horses, or with the assistance of very few—an object of some moment (notwithstanding the facilities afforded by one-horse harvest carts), now that steam tillage is banishing a large proportion of the farm teams. The price is certainly extremely low; for horse power, of course, the whole apparatus must be much stronger and more expensive.

Mr. S. D. MORGAN's American reaper has a self-raking movement, which is extremely ingenious. The action of the rake upon a cranked bar, with cams and a spring, cannot be clearly described in letter-press; the movement, however, is reciprocating—an improvement upon other reciprocating rakes, but probably inferior in various points to the smoothly-working continuously revolving rakes which have now come into practical use.

Messrs. HUNT and PICKERING had a good show of ploughs, drills, and their superior root pulpers.

Messrs. MAPPLEBECK and LOWE had an exceedingly fine stand, including a very varied assortment of articles from their own and other manufacturers' works. Their chaff-cutters are strong, cheap, serviceable machines. Their new weighing-machine for carts or cattle dispenses with the cumbersome brick work and difficult setting of the old machines; the mechanism is perfectly simple, and not liable to derangement, and weighs up to three tons. Though not exactly agricultural, the improved hand road-scraping machine, and again the portable soup-boiler and the portable kitchener (a complete cooking range requiring no setting), should be mentioned as improvements; the cooking apparatus being especially valuable now that alimentary preparation on a large scale is being adapted to the requirements of the working-classes.

Messrs. BLINKHORN and SHUTTLEWORTH exhibited their extraordinary little force pump or agricultural fire engine, which does wonders in throwing a large volume of water to a great height with very little power applied.

On the stand of Messrs. AMES and BARFORD we saw their different-sized iron rollers, which consist of water-tight cylinders, weighted at pleasure to double the actual weight of the implement by being filled with water; the extra weight rolling directly upon the land, without pressure upon the axle bearings.

Messrs. COLEMAN and SONS exhibited their celebrated pine cultivators, the rotary potato-digger, and a new horse-hoe, jointed so as to accommodate itself to uneven ground. Their steam-ploughing machine has been spoken of in another place.

Of Mr. FOWLER's steam-ploughing, cultivating, harrowing, land-pressing, and drilling apparatus, we have already reported.

Messrs. J. F. HALL showed, among a large assortment of agricultural, horticultural, and domestic articles, a novelty in the shape of a "balloon meat safe," in which joints are hung inside a curtain of gauze, completely protecting them from flies, while freely admitting air. This cheap and admirable contrivance cannot fail to be appreciated this hot weather.

Messrs. PETERS BROTHERS exhibited some excellent chaff-cutting machines, combining numerous improvements. Their combined steam-engine, turnip-pulper, and steaming apparatus, is contrived to cook roots, &c., with the waste steam from the

engines; a very economical arrangement admirably carried out.

Messrs. PAGE & CO. had a good show of ploughs, harrows, grubbers, and their drain-pipe and brick-making machines.

On the stand of Messrs. UNDERHILL we observed a spring hook, intended to prevent the breakage of ropes in steam cultivation. A spiral spring is so set as to release a hook and set the rope loose from the implement, at any given strain. The price is moderate, and the safety afforded recommends this hook to the employers of all steam-ploughing apparatus, where there is no "slack gear" upon the implement.

Messrs. F. W. ASHBY & Co. exhibited several of their double-action haymaking machines, with sets of knives for cutting young thistles, and sets of forks for separating and spreading manure upon grass land by the same machine; also a number of chaff engines, oilcake breakers, and their very efficient rotary harrows.

Mr. BRADFORD's washing machines attracted as much attention as ever; besides the well-known rocking-washer, he has another machine, in which a ribbed roller rubs the clothes against a yielding diaphragm underneath, this being formed of wood rollers threaded upon elastic India-rubber straps, the action giving a knocking effect, rubbing the clothes without any possibility of injury.

Mr. RICHARD SMITH had a very pretty show of coniferous trees, in tubs and pots; and of greenhouse plants and cut flowers.

The department for seeds, roots, models, &c., was very extensive; we can mention only some of the more interesting stalls. Messrs. Thomas Gibbs & Co. (the Royal Agricultural Society's seedsmen) surpassed all competition in their show of dried specimens of grasses, grain in the straw, &c., their roots and samples, and seeds inclosed in innumerable glass vases, formed quite a study for every farmer with a botanical taste or a desire for good stocks with which to seed his ground.

Messrs. SUTTON and SONS also contributed a valuable collection of seeds, grains, and grasses, with pictorial representations of the best roots.

Mr. SIMPSON showed samples of farinaceous food, horse-feed in which rich and nutritive diet is doctored with valuable condimental ingredients, intended to assist digestion and preserve the health of highly-fed animals.

Mr. CHAS. STOKES exhibited a cart-horse collar, which is expanded or contracted by means of a toothed catch, so as to adapt it to shoulders of all shapes; no hames are required: the collar is easily put on and taken off, and there is no liability of a horse becoming choked with it.

We have now mentioned most of the "novelties and notabilities," unavoidably omitting many stands and stalls that present perhaps equal claim to a specific mention; but our columns are limited, while the number of articles in a Royal Agricultural Show-yard hardly is.

A CATALOGUE OF THE AGRICULTURAL IMPLEMENTS, &c., EXHIBITED AT THE WORCESTER MEETING, IN 1863.

ALLCOCK (THOMAS), Ratcliff-on-Trent.

Horsehoe for ridge or flat, with expanding harrow and set of grubbers, £3 5s., also horsehoe at £2 10s.; two-horse scuffer and grubber 4 ps., horse-rakes £7 10s. and £8; chaffcutters £5 10s. to £18 10s.

ALLCHIN and SON, Northampton.

Ten-horse traction steam engine for ploughing, thrashing, &c., £390; six-horse portable steam engine £196, combined thrashing machine £93, corn grinding mill £42, screwjack for lifting three or four tons £1 2s. each.

ALLNUTT (HENRY), 200, Fleet-street, London.

Wheat diagrams showing the fluctuations in the imperial averages for 200 years, collection of agricultural books and instruments, "The Estates Gazette," with Ordnance and geological maps.

AMIES AND BARFORD, Peterborough.

Adjustable water ballasting land rollers £10 to £40, ditto garden rollers £3 5s. to £5 10s., clod crushers and land rollers £10 and £15, unbreakable land rollers £8 and £9 10s. Stanley's roll scrapers £2, also his steaming apparatus £18 to £25 10s., watercart £25, oilcake mills 3 ga. to £6, combined sack barrows and elevators £3 5s. to 4 ga., Lyne's patent field stiles £2 2s. to £2 8s.; Bailey Denton's pipes for outfalls of underdrains, threethird bore 6s. to twelvethird bore 2s. 6d.; also his well and pump covers and tidal and backwater valves £3 10s.; sheep troughs six feet long 16s., twelve feet 32s.; Weston's differential pulley blocks £1 17s. 6d. to £5.

ARCHER (E.), Old Paradise-row, Islington Green.

Washing, wringing, and mangling machines £6 10s. and £8 10s., washer and wringer £4 10s., washer 3 ga., wringer £1, manglers and wringers £1 12s. to £3, starcher and wringer £1, portable clothes dryer £7 6s., rotary boot and shoe cleaner £3 15s., assortment of implements for household purposes, including cucumber and vegetable slicers, knife and scissor sharpeners, butter prints and dairy utensils, polishing brushes, knife cleaning machines and boards, magnetic hammers, and Smith's apparatus for cleaning chimney lamp glasses, 1s. each; Smith's tube brushes 5s. upwards; sausage and mincing machine 16s.

ARMSTRONG (JOHN), Clifton, Cumberland.

Twohorse wheel plough £4 15s., ditto swing plough £4 5s., pony plough £3 5s., ridging ploughs—for light land £3 10s., for strong land £4, potato lifter £4 10s., horseshoe £3 10s., twohorse grabber £3 10s., fourbeamed jointed harrows £4, chain harrow £4 for eight feet wide.

ARNOLD AND SONS, West Smithfield, London.

Cattle elyzer syringe £2 10s., cattle probang 15s., balling gun 5s., milking siphons 1s. 6d. and 2s. 6d., thoroughpin truss 15s., bullock holder 18s., and an assortment of veterinary instruments.

ASHBY AND CO., Stamford.

Double action haymakers 12 to 16 ga., horseshoes £8 to £10, wheel handrake £2, portable steam engines—threehorse £98 5s., 4½-horse £138, fourhorse portable flour mill £35, combined thrasher £68, chaffcutters 2½ to 14 ga. with pulley, oilcake mills £3 5s. to £3 10s., new haymaker with wire screen £17 11s., rotating harrows £4 10s. to 6 ga.

AVELING AND PORTER, Rochester, Kent.

Road locomotive engine, with double gearing for speeds of 2½ and 5 miles an hour, on an incline of 1 in 12 with 20 tons, £580; agricultural locomotive engine £420; tenhorse nominal, but up to fortyhorse power, for steam cultivation, thrashing, sawing, and removing agricultural produce, £420; a smaller ditto £360.

ASHFORD (THOMAS B.), Walham Green, London.

Farmer's spring market cart, and an improved London-made gentleman's or tradesman's cart, £80 and £31 10s.

BADGER (J. AND W.), Worcester.

Close fire kitchen ranges £5 10s. to £30, cottage ranges £1 5s. to £4, cooking ranges for open fire £1 4s. to £4 10s., register black grates 30s. to £14, bright stove £25, garden chairs 20s. to 35s., garden roller 55s., compound lever cheese-press 70s., Samuelson's lawn mower £8 10s., cider press screws £5 per pair, general purpose pump 45s., cottage pump 25s., corn stack pillars 4s. and 5s., cast steel digging forks 4s. and 5s., bronzed hat and umbrella stand £2 15s.

BAINES AND DRAKE, 15, Cannon-street West, London.

Water gauges from 18s. to 40s., gauge cocks 4s. to 12s., jet cocks 2s. to 6s., blow-off cocks 8s. to 40s., oil siphons and tallow cups 1s. to 30s., steam whistles 6s. to 50s., valve cocks 2s. 6d. to 30s., Bourdon's pressure gauges 65s. to 38s., Salter's ditto 35s. to 65s.

BAKER (JOHN), Wisbeach.

Combined dressing and winnowing machines, fitted with blowing hopper complete, and all modern improvements, including six best handwoven diamond mesh riddles, and bean, wheat, and barley screens, £9 10s. each.

BAKER (THOMAS), Compton, Berks.

Self-balancing portable iron watercart, with valves instead of taps, to prevent danger in frost, 12 ga.; liquid manure cart upon same principle, and fitted with pump attached to vulcanised indiarubber pipe, £20, watercart for cattle and steam-engines £31 5s.

BALL (GEORGE), North Kilworth, Leicestershire.

Two or threehorse waggons £33, carts for one and two horses for general purposes and fitted with curved harvest raves £14 to £15, iron ploughs £4 4s. to £4 8s., scarifiers £5 10s. and £6 10s., iron harrows £3 7s. 6d. and £3 12s. 6d.

BALL (WILLIAM), Rothwell, Northamptonshire.

Iron ploughs £4 4s. and £4 8s., ditto for deep ploughing £5 10s., double plough £7 10s., ridge or double breast plough 4 ga., one or two-horse waggons £26 and £30, three or four-horse ditto £33, carts for one horse £14 10s., ditto for one or two £15, scarifiers £6 10s. and £7 10s., horsrake £8, Taylor's diagonal harrows £4, light ditto £3 10s.

BAMLETT (ADAM), Ripon.

Combined reaper and mower £32, reaper with manual delivery £33, balanced reaper £25, ditto without side-draught and for two horses abreast £36, model of the manual delivery reaper.

BARNARD, BISHOP, AND BARNARDS, of Norwich.

Dr. Ager's digging machines £12 to £35, rootpulpers £3 5s. to £10, rootgraters £3 10s. and £4 10s., Gardner's turnip cutters £4 10s. and £5 10s., barley hummeller £4 10s., double Norfolk pig troughs 7s. to 16s., single ditto 8s. 6d. to 18s., Windsor and circular pig troughs and iron troughs with circular bottoms 4s. to £2 5s., troughs for dogs 2s. 6d. and 3s., for poultry 1s. 9d. to 6s., registered ditto with fountains 10s. and 15s., horse or cattle crib 30s., manglers £3 10s. to £7, centrifugal wringing machine £5, strained wire fencing 6d. to 1s. 6d. per yard, sheepfold hurdles on wheels 19s., cast-iron window frame and casement 10s. to 18s., galvanised wire netting 4d. to 2s. 3d. per yard, greasing jack for gigs and carriages 6s., sack harrow 10s., noiseless lawn mowers £4 10s. to £5 10s., garden and park stools and chairs 4s. 6d. to £3 5s., Burrows' garden rocking lounge 50s., garden tables 24s. to 30s.

BARRETT, EXALL, AND ANDREWES, Reading.

Steam engines, fixed horizontal four-horse £110, six-horse £150, ten-horse £230, portable three-horse £120, six-horse £195, eight-horse £230, twelve-horse double cylinder £310, combined thrashing machines for steam power, 54-inch portable £110, 60 inch fixed £108, 48-inch portable for three-horse engine £82 10s., same size rotary portable fitted with rotary drum and breasting £83 10s., perforated beater drum £9 10s., grinding mill on travelling frame £81, safety chaff cutters £11 to 15 ga., grain-crushing mills £8 10s. to 10 ga., thrashing machine and horsegear £39 10s., one-horse gear and intermediate motion £18 15s., reverse action haymaker 14 ga., horseshoes £6 15s. to £9 8s., donkey engine pump £36, circular-saw bench £22 10s., screw-lifting jacks 2 to 3 ga.

BARROWS AND CO., of 76, Cannon-street West, London.

Portable steam engines with multitubular boilers, two-horse £75, four-horse £165; small strong and compact portable four-horse multitubular boiler steam engine for driving a turnip cutter, pulper, chaff cutter, and an oat and bean mill at one operation, £145; three-horse portable £100, six-horse ditto £200, eight-horse double cylinder ditto £245; four-horse power fixed steam engine with Cornish boiler £95, without boiler £60; pedestal engine, 2½-horse power, requiring no brickwork, £85; portable thrashing and finishing machines, three-horse power winnowing and sacking £70, four-horse combined for a hilly country £90, full-sized combined double-blast £105, with bean-thrashing apparatus £3 10s. extra; Samuelson's turnip cutter £4 10s., his root pulper £4 10s., chaff cutter £7, oat and bean mill £6 15s.; King's patent hurdle fastenings £4 per 100 sets.

BARRY BROTHERS, Meriton's Wharf, London, S.E.

Long's specifics for disorders of scab or shab among sheep 2s. 8d. to 6s. per gallon, his foot-rot lotion 2s. 6d. per pint, and specimens of fleeces dressed with his non-poisonous sheep-dressings, showing how they take the dyes and the beneficial effects upon the wool produced by the "preservative," "eradicator," and "concentrated specific."

BARTON AND SON, Carlisle.

Sheeting cars £30 to £50, Victoria car £31 10s., Carlisle car £30, Scotch car £34, basket cars £18 to £20.

BAYLISS, JONES, AND BAYLISS, Wolverhampton.

Wrought iron cattle hurdles 4s. to 10s., game proof ornamental garden hurdles 8s. 6d. to 5s. 3d. per yard, strained wire fences 1s. 1d. to 1s. 9d. per yard, continuance sheep and cattle fences 2s. 1d. to 2s. 7d. per yard, ditto deer fence 3s. 4d. per yard, sheepfolding hurdles on wheels £1 for 12 feet, footpath gates £1 18s. 6d. to £2 12s. 6d., tube gates £1 14s. and £6 10s., field gates £1 4s. to £3 10s., ornamental entrance gates 5s. to £12 10s., tree guards 15s. to £1, ditto for shrubs 6s. 6d., garden stakes 8s. 6d. to 21s. per dozen, handgates £2 2s. 6d. to £3 2s. 6d., galvanised wheelbarrows £1 10s. and £1 18s., camp stools with elastic galvanised wire seats 4s. 6d., garden chairs 8s. 6d. to 18s., game proof wire netting 6d. to 10d. per yard, Bayliss's self-relieving chain harrow £3 18s.

BEARDS (THOMAS), Stow, Bucks.

Combined steam plough with grubbers and cultivators £63 10s.

BELL AND HALL, Worcester.

Howard's iron ploughs £2 5s. to £4 12s. 6d., Ransome's ploughs £3 to £5, other iron ploughs £3 10s. to £4 5s., Howard's iron harrows (four beamed) £2 17s. 6d. to £3 10s., Ransome's excelsior harrows £4 10s., Ransome's three beamed 3s. to £4 6s. 6d., other iron harrows £1 14s. to £2 6s., Bayliss and Co.'s spring expanding chain harrows £3 5s., Howard's trussed and tubular whippettrees 11s. 6d. and 17s. 6d.; horsehoes, expanding £3, light £1 15s., with grubbers £2 10s., scarifiers £5 10s. and £6 10s., skims £3 15s. and £5, Crosskill's clodcrusher £16 10s., Crosskill's one horse cart £12 10s., with harvest abelings 30s. extra, Howard's double action haymaker 15s., Nicholson's single action ditto 10s., horsehoes—Howard's £3 5s., Ransome's £3 5s., three and five row wheat drills £4 10s. to £8, two row bean drill £3 10s., one row turnip and manure drills £2 12s. to £3, seed sowing machine £3 5s., Fry's winnower £7 10s., horse gears £13 10s. and 12s., chaff cutters £2 5s. to £10 1s. 6d., root pulpers £4 10s. to £5 15s. 6d., turnip cutters £4 10s. to £5 10s., bean and oat mills £2 3s. 6d. to £4, oilcake mills 2 to 5 ga., sheep rack £3 6s., cow crib £2 6s., manure pump £3 15s., cheese presses £3 10s. and £2 15s., double ditto 5 ga., weighing machines 2 ga. to 80s., garden rolls 35s. to 50s., lawn mowers £3 10s. to £7 10s., sack trucks 12s. 6d. to 17s., pig troughs 6s. to 21s., cattle trough 12s. 6d., poultry pots 2s. to 5s. 6d., hayrack and manger 55s., rakes 3s. 6d. to 18s., hay and other forks 2s. 6d. upwards, garden spades from 1s. 6d. upwards, garden tools from 1s. 9d. the set, draining tools 2s. each and upwards, garden chairs 16s. 6d. to 50s., flower-pot stand 42s., umbrella stands 11s. 6d. to 30s., cottage range 30s., Leamington range £14, fireproof safes £5 10s. and £6 5s., iron wheelbarrows 30s., Weston's differential pulley blocks 50s., palisade wickets 30s., cattle and sheep hurdles 3s. 6d. to 6s., continuance cattle fence 2s. 8d. per yard, galvanised wire netting and japanned ditto 5d. and 6d. per lineal yard, reaping felt 1d. per foot, road scraper £5 15s., mower £33 10s., washer, wringer, and mangler 7 ga., mangle £5 10s., wringer 25s., knife cleaser 3 ga. to £4 15s., churn 32s. 6d., manure machines 31s. and 30s., hydropont 2 ga., tapping mallets 1s., beer taps 2s. 6d., drenching bottles 2s. 6d., milkpans 2s. 6d., monastrops 2s. 6d., axes 2s. to 4s., billhooks 2s., scythes 7s. 6d. to 12s., chimney tops 6s. galvanised.

BENTALL (E. H.), Maldon, Essex.

Sets of harrows, three beamed light seed £3 18s. 6d. and £3 13s., medium £3 14s., four beamed heavy £4 5s.; broad-shear scarifier, cultivator, and subsoil ploughs £4 to 7 ga., combined ridging plough and horsehoe £3 14s. 6d., double ridging hoe £3 18s. 6d., light cultivator and grubber £4 10s.,

corn dressers 46 and £8, corn and seed crushers 5 to 14 ga., bean kibblers 2½ to 3 ga., oat mill 3 ga., universal mill 5 ga., chaff cutters £2 5s. to 11 ga., root pulpers 3½ to 7 ga., Gardner's and exhibitor's own turnip cutters £4 10s. to £5 10s., oilcake mills 3 to 6 ga., two-horse gear 14 ga., intermediate motion 3 and 4 ga., two-horse thrashing machine 15 ga., ditto with horse gear and intermediate motion £34 13s.; pig or sheep troughs 5s. to 16s., round ditto 10s. to 16s.

BETTRIDGE (JOSEPH), Wellesbourne, Warwick.

Waggonette with moveable head to form a close carriage fashionable and light for one horse £85, dogcart £62 10s., basket carriage £30, basket gig for a pony £13 10s., Malvern dogcart 55, Malvern Whitechapel £36, market cart fitted with lamps and cushions £18.

BIRD (CHARLES), Worcester.

Simpson's specific for cure of foot-rot, Giles Colley's spirits for sprains and bruises, Badger's mixture for foot-rot, Eadie's drying drenches, Bird's balls and powders, Watkins' footbath remedy, Long's sheep-dipping composition, Rossiter's anti-ferment for cider, Lipscombe's water-filters, and samples of lavender water.

BLAYLOCK AND PRATCHITT, Carlisle.

Steam engines, portable four horse £150, eight horse £220, fixed four horse £85, eight horse £165.

BLINKHORN, SHUTTLEWORTH, AND CO., Spalding.

Agricultural force pumps or fire engines £16 to £31, small garden ditto 50s., domestic pumps 45s., canvas cistern 42s., fire buckets 70s. per dozen.

BLUNDELL AND CO., 27, Snow Hill, Birmingham.

Simpson's farinaceous food for cattle, in bags £23 per ton, in cases 28s. per cwt.; prepared horse corn, in bags 14s. per cwt., condimental feeding meal £12 to £16 per ton, flavoured feeding meal £9 10s. per ton, superfine flour £2 15s. per sack, seconds ditto £2 5s.

BOBY (ROBERT), Bury St. Edmunds.

Corn screens, with blower and riddle, £15; with extra separator 10 ga., without separator £7 to £20 15s.; double action screening machine, having two screens working from one spindle, £16; double malt screen with extra separator for removing large substances £27, pulley for power £1 1s., malt mill for ditto £25; barley hummeller or aveller £4 10s.; double-action haymakers 13 ga.; light barley roll £11.

BOSTOCK (THOMAS), Burslem Potteries, Staffs.

Bentall's chaffcutter 5 ga., Mellard's treadle chaffcutter £2 15s., Corne's chaffcutter £3 5s., Richmond and Chandler's chaffcutter £5 10s., Pickersley's chaffcutter £5 12s. 6d., Bentall's malt, corn, and seedcrushing mill 5 ga., Mellard's oilcake mill £2 15s., Biddell's bean and oatmill £6, Corne's Cheshire curdmill £2; Howard's iron plough, with two wheels, cast breast, skid coulter, and drag chain, £4 9s. 6d.; Ransome's general purpose plough, £4 12s. 6d.; Hornsby's iron plough, with steel breast, £4 19s. 6d.; Hunt and Pickering's two-wheel plough, £4 18s.; Howard's jointed harrows, £3 16s.; Pickersley and Sims' conical rootpulper 6 ga., Hunt and Pickering's disc rootpulper £4 10s., Samuel's "Eclipse" manual delivery reaper 16 ga., Bradford's combined washing machine 8 ga., Hornsby's ditto 7 ga., Leicester garden seat 18s.

BRADFORD (THOMAS), Manchester.

Two and a-half horse portable steam engine, £80; washing machines £3 10s. to £6 10s.; combined washers, wringers, and manglers, 8 to 25 ga.; atmospheric dash washing machine £4 10s. to 10 ga.; combined washer, wringer, and mangler 6 ga.; wringer and mangler 2 to 5 ga.; three-roller mangles £4 10s. to 5 ga.; Baker's longbox mangle £11 10s.; "Acorn" indiarubber clothes wringer £1 5s. to £3 5s., churn £1; cinder sifter, mineral, or cereal separator £2 10s., combined washer and rinser for steampower £40.

BAGGINS (JAMES), Banbury, Oxon.

Set of handsome park gates and posts with patent ironwork £15 10s., lodge gate £4, entrance gate £2 10s., strong fieldgate 27s. 6d., bridled gate £1, set of fieldgate hinges 10s., parkgate ditto 27s. 6d.

BRIDGES (HENRY), 406, Oxford-street, London.

Butterprints of various patterns and designs 6d. to 10s., and a variety of dairy implements.

BROWN AND MAY, Devizes, Wilts.

Portable steam engines, tenhorse £250, eighthorse £220, two and a-half horse £75, Humphries' portable combined thrashing machine £75, agricultural locomotive eighthorse traction engine for two speeds of four and two miles an hour £360.

BROWN AND CO. (Agents to E. MANCUR), 11, Cullum-street, London.

American scales to weigh hay, sheep, kegs of butter, to test strength, and for use in racing, 5s. to weigh 200lbs., to 15s. for 500lbs.

BROWN AND CO., 18, Cannon-street, London.

Shanks' lawnmowers 5 gs. to £12 10s., garden roller with back balance £2 10s., double cylinder ditto £3 15s., garden barrow engine £3 15s., hurdles 5s. to 7s., continuous fence 3s. 4d. per yard, fieldgate 27s. 6d., pillars for same 25s., carriage gates and pillars £7, entrance gates with lock and key £15, bronzed ditto £17, wicket gate 35s., vases £1 to £3 10s., pedestals 12s. to 30s., ornamental fountain, £7 10s. to £16, bronzed flowerpot stands 30s. to £2, bronzed garden or hall table 45s., garden table with wood top £1, wrought iron park and garden chairs 4s. 6d. to 18s. 6d., Leicester garden seats 18s. to 27s., cast iron bronzed garden seats £1 12s. 6d. to £2 7s. 6d., galvanised and japanned netting 4½d. to 10d. per yard, strained wire 17s. for 100 yards and £11 15s. per ton, cornrick stands £5 10s. and £7 15s., Stevens' breadmaking machines £2 to £3 10s., cow-milker £2 10s., cornbins £1 5s. and £1 7s. 6d., portable fencing 3s. to 5s. per yard, fourhorse upright stationary engine £105s., Holman's pumps £1 and upwards.

BRUCKSHAW (HENRY), Market Drayton, Salop.

Combined portable steam thrashing and finishing machine, fitted with new patent corn elevator, and mounted on four strong carriage wheels, £95.

BRUCKSHAW (JOHN), Market Drayton.

Sixhorse power portable steam engine £206 14s.; sixhorse power combined thrashing machine, with patent corn elevator, Goucher's drum, and new dressing machine £90.

BURGESS AND KEY, 95, Newgate-street, London.

Grass mower £25, combined reaper and mower £30, M'Cormick's new reaper for delivering the corn in sheaves by an automaton rake £34, his screw-delivery reaper £36, combined automaton-rake and screw-delivery reaper £42 10s., grass-mowing machine £20, chaff cutters £2 15s. to £6, liquid manure pump £3 15s., ditto to be used as fire engine £15 5s., pump with four-inch barrels £9 1s., patent water jet 3 gs., American churns £1 15s. to 3 gs., American mincing machines 1 and 2 gs., sack trucks 14s. to £1, Otway's adjustable scythe 10s., beer tilt 10s. 6d., garden seats from 10s. 6d., set of garden and draining tools 4s. 6d.

BURLINGHAM AND CO., Evesham.

Baker's corn dressing machine £9 10s., Hollis's ditto 10 gs., Boby's corn screen 9 gs., Hill and Smith's light land roller 10 gs., Ransome's lawn mower £7, Richmond and Chandler's chaff cutters £3 15s. to £16, Bentall's ditto 2½ to 5 gs., Cornes' ditto £8 10s., Pickaley's ditto £7 12s. 6d. to £9 12s. 6d., Bentall's cake breaker 3½ gs., Hunt's ditto £3 10s., Ransome's ditto £4; turnip cutters—Hornaby's £4 10s., Gardner's £4 10s.; pulping machines—Hornaby's £4 12s. 6d., Hunt and Pickering's £4 10s. to £6, Bentall's 5 gs.; kibblers—Smith's £3 15s., Biddell's £4; steel oatmeal £3 15s., combined bean cutter and oat mill (Biddell's) £6, corn crusher £7 6s. 6d.; iron ploughs—Hornaby's £4 12s. 6d. to £5 6s. 6d., Howard's £3 15s. to £5 6s. 6d., Ransome's £2 5s. to £5 5s., Seaman's £4 12s. to £5 2s.; potato-raising plough £3 15s., Howard's scufflers 7-tine £6 15s., to £8 10s., Coleman's cultivators £7 to £9, Bentall's broadshare £5 7s. 6d., Howard's two share skim £5 15s.; Reeve's turnip and mangold drills—three-row 10 gs., four-row 12 gs., seven-row corn-drill £15 10s., broadcast manure distributor £10 15s.; driving gears—Richmond and Chandler's twohorse £16 10s., Hunt's onehorse 11 gs.; Cresskill's light spring cart £12 15s., sets of three

4-beam harrows—Howard's for onehorse £2 10s., Seaman's, up to three horses, 3 to 5 gs.; chain harrows—Baylis' £3 15s., Denton's £2 15s.; Howard's steeltooth horse rake £8 5s., Pickaley's conical pulper 6 gs., Hornaby's corn and seed drill £27 15s., Richmond and Chandler's chaffcutter £4 10s.; Carson and Toone's cheese-presses—single £2 15s., double 5 gs.; Tinkler's barrel churns £4 2s. 6d. to £4 17s. 6d.

BURNEY AND BELLAMY, Millwall, London.

Wroughtiron liquid manure or water cart body holding 200 gallons £4 5s., and cistern to hold 400 gallons £5, galvanised iron cisterns 5d. to 9d. per gallon, iron cattle-troughs holding 50 gallons £1 10s. to £2 15s. for those containing 110 gallons, wroughtiron corn bins for 1 qr. £2 and 2 qrs. £3, sheep drinking trough on wheels £3 10s., very strong wroughtiron hog trough 3s. 6d. per foot.

BURROW AND CO., Leigh Linton, Malvern, Worcestershire.

Sixhorse portable steam engine £175, twohorse ditto £85, portable combined thrashing machine £100, hand dressing machine £6 10s., haymaker with double action £12, horse rake £6, Bamlett's reaper £25, twohorse gear £12, general purpose cart £12 10s., three-furrow wheat brush and nut drill £4 5s., Pickaley's chaff cutter £7 12s. 6d., root pulpers 5 gs. and £3 15s., Biddell's bean cutter £4, his oat mill £3 15s., Gardner's turnip cutter £4 10s., Pickaley's turnip slicer £3 15s., garden chairs 30s. per pair, pair of cider screws £6, pair of iron arms and naves 1½ gs. per cwt.

BURY AND POLLARD, Southwark.

Self-regulating wind-power engine £95, crushing mill £7 10s., chaff cutter £12 10s., double-action agricultural pump £16, conical boiler £8, Jones' anti-frost water pipe protector £2 10s.

CAMBRIDGE (WM. C.), Bristol.

Double-action presswheel roller and clodcrusher £6 to £14 jointed self-expanding and dividing chain harrows £2 15s. to £4 10s., washing machines £3 to 4 gs., clothes ringer 25s., mangle 2½ feet rollers 5 gs.

CARSON AND TOONE, Warminster.

Chaff cutters £4 to £15, Moody's turnip cutter £4 10s. to £5, horsehoes £3 10s. to £4 5s., horse gear 12 gs., cross-cut wheel rollers £9 10s. to £13, three-share grubber and scarifier 6 gs., oilcake crusher 3 gs., garden roller £4 10s., single cheese-press £2 15s. to 3 gs., double ditto 5 gs.

CARTER (CHARLES), Swan Lane, London, S.E.

Screw-power combined mowing and reaping machines £30, bruising mill with smooth roller £4 15s., Bentall's chaffcutters £2 5s. and £3 13s. 6d., twelve-row Suffolk corn drill £25 10s., eight-row ditto for small occupations £18, Garrett's patent lever horsehoes £20, Taylor's ditto £14, Chambers' broadcast manure distributor £16 10s., seed and manure drills—Garrett's three-row £16 10s., Chambers' five-row £28 2s. 6d., Hunt's disc root pulper £4 10s., oilcake breaker £3 10s., kibbling mill £4 7s. 6d., twohorse horizontal fixed high-pressure steam-engine £28 10s., Morton's sun-and-planet-motion lawn mowing, rolling, and collecting machine £4 15s. to £6 7s. 6d., metallic corn bin £1 5s.

CARTER AND CO., 238, High Holborn, London.

Collection of samples of agricultural and garden seeds and of mixed grasses, with samples of growth in pots.

CHILDE (W. J. AND T.), Hull.

Pair of French burr millstones £24 to £30, Derbyshire Peak millstones £6 10s., cast steel mill chisels 1s. 2d. per lb., iron hfts 5s. 6d., metal provers £2 10s., oilpress hair and bagging for oil mills £3 4s.

CHILDS (of 481, Oxford-street, London) and **RICHES AND WATTS** (of Norwich).

Eighthorse portable steamengine £200, fourhorse horizontal fixed without boiler £65, American grist mill £25, nonpareil chaffcutter £25, combined thrashing machine £115, grain separators £20 to £40; Redston's American sawing machine, to cut with one-horse power, at a speed of 160 to 200 revolutions per hour, 2,500 cubic feet in ten hours, £20; Sweet's churns 30s. to 70s., broadcast seed-sower 30s., Silver's eyeless picks 4s. 8d. to 5s. 9d., clothes washer, wringer and starcher 30s., posthole augers 20s. to 24s., magnetic hammer 1s., best coolers £60 to £240.

CHIVAS AND WEAVER, Chester.

Samples of transplanted larch 17s. 6d. to £2 5s. per 1,000, Scotch fir 30s. to £2 per 1,000, spruce £1 17s. 6d. to £3 per 1,000, strong plants of English oak £2 10s. per 1,000.

CLARKE AND SON, BRACKLEY, Northamptonshire.

Adjustable garden scythe with wrought iron tubular handle 9s. 6d.; for heavy crops of grass and corn, 10s.; for corn only, and having a cradle for delivering in swathes, 12s. 6d.

CLARK AND SON, Leeds.

Hogskin saddles £2 to £7, harness 5s. to £10, horse clothing £2 7s. 6d. to £3 10s., travelling suit of horse cloths £1 8s., body rollers 6s. and 10s., knee cap 4s. 6d., head collars 5s. to 10s., hunting saddle cloth 8s., hogskin pad for boy or girl £2 10s., bridles 4s. 6d. to £1 7s., hunting breast-girth 12s., round martingale 5s.

CLAY (CHARLES), Wakefield.

Cultivators and eradicators £6 5s. to 11 ga., horse hoes £2 to £3 15s., chain harrows £4, ridge harrows 30s. per set, model of cultivator for steam power.

CLAYTON, SHUTTLEWORTH, & Co., Lincoln.

Steam engines, fixed ten horse horizontal prize £240, eight horse £200, portable prize patent double cylinder twelve horse £340, single cylinder eight horse £235 and £230, seven horse £215, six horse £200, four horse £165, five horse patent combined single cylinder steam pumping machine and Appold's centrifugal pump to raise 900 gallons per minute at a lift of 10 ft. £238; combined portable prize finishing thrashing machines, including the new patent corn elevators, double blast £93 and £110, single £100; portable straw elevators, Hayes' £23, Campaign's £25; prize steam power grinding mills £60 to £90, circular-saw benches £21 to £45, the latter with self-acting motion and boring apparatus £65.

CLINTON AND OWENS, Whitefriars, London, E.C.

Cast iron bored pumps £1 1s. to £7 5s., ornamental gothic panel pump case £7, lift pumps on planks £3 12s. to £7 14s. 6d., brass deep-well barrels £5 12s. 6d., deep-well pumps with double barrel £9 10s. to £17, with treble barrel £20 to £36 10s.; deep-well handle £2 10s., well engine frames £9 to £18, pillar horse gear £41 10s., cast iron air-vessel with copper dip pipe 25s., portable pumps £2 5s. to £7 7s., irrigating pumps £5 15s. to £15 10s., garden engines £4 10s. to £5 15s., swing water carriers £2 2s. 6d. to £2 12s. 6d., Holman's double-barrel force pump 15 ga., farm fire engines £15 to £26, pumps for steam power £11 10s. to £21 10s., hydraulic rams 5 ga. to 15 ga., hose pipe and fittings £8 10s., double barrel force pump in frame £25, treble barrel £50, feed pump £15, head pump £25, vulcanized india rubber suction hose 2s. per foot, india rubber delivery hose 6d. per foot, wove canvas ditto 6d. per foot, pulley blocks 11s., black and galvanised pails 2s. each, combined steam engine and pumps for water or liquid manure £175, assortment of fittings for force pumps—swivel hose unions 2s. 6d. each, baskets for end of suction from 2s., branch pipes and jets from 15s., retaining valves for suction from 7s. 6d.

COLEMAN AND SONS, Chelmsford.

Yarrow and Hilditch's set of steam cultivating apparatus, consisting of ten horse power patent double cylinder engine with self-moving and reversing gear and windlass, two patent cultivators, anchors, ropes for 400 yards furrow, rope porters and field tools, £645; jointed clod crusher £20, potato digger £18; cultivator, grubber, and scarifier £8 to £14 10s.

COOCH (JOSHUA), Harleston.

Corn-dressing machine £18 to £14 10s., seed dresser £12 10s., small seed apparatus £2, barley hummeller £4 10s. and £6, model of corn-dressing machine.

COOK (JOSEPH), Hartlebury, Worcestershire.

Strong four horse farmers' waggon £46, light three horse £36, two horse £30, one or two horse cart £14 10s.

COOKE (JOHN) AND Co., Lincoln.

Iron ploughs £2 11s. to £4 10s., wooden ploughs £3 7s. to £3 15s., the latter adapted for fen or marsh land.

COOMBER AND Co., 68, Mark Lane, London.

French millstones £16 each or £28 per pair, smut machines £15 to £30, revolving flour machines at prices according to

size, brushes for flour dressing machines 2s. to 2s. 6d. per foot, ditto for smut machines 1s. 4d. to 2s. per foot, twelve mill chisels 1s. 4d. per lb., leather straps 2s. and 3s. 6d. per foot, mill brooms 5s. 6d. and 7s., screwjack for lifting £2 10s., pair of pulley blocks 2 ga., proof staff and case 3 ga., jointed wood staff 30s., webbing for elevator straps 1s. 4d., kiln-wove wire 1s. 5d. per square foot, sack trucks 14s. and 18s., weighing machines £3 10s. and 5 ga., machine wire in iron, brass, and copper.

CORBETT (SAMUEL), Wellington, Salop.

Four-horse power portable steam engine £100, bark mill £60, circular saw table £18, mill for power £10, for hand 6 ga., oilcake breaker £12, chaffcutter £9, champion rootpulper £5 10s. and £8, oilcake breaker £3 10s., intermediate motion 10 ga., double action turnip cutter £5 10s.

CORMELL (JOHN), Cheltenham.

Iron ventilating conservatory £50, water cart £12, wrought iron tanks £2 1s. 8d. to £6 5s., cattle troughs £1 to £1 18s., corn bin £2 5s., cast iron pump £1 2s. 6d. to 2 ga.

CORNES (JAMES), Barbridge, Cheshire.

Dressing machine £7, chaffcutters £2 10s. to £15, four-horse power works £19, one-horse ditto £10 and £12, four-horse power thrashing box £16, cheesemaking apparatus £2 10s. 6d. to £3 16s., curd mills £2 and £3 10s., cheese presses £2 10s. to 5 ga., cheese stools 10s. to 16s.

COTTAM AND Co., 2, Winsley-street, London, W.

Stable stalls £4 13s. to £6 4s., loose box £6, side £8 4s., front £6 14s., door 5 ga., and partition £4 19s., manger and trough £5 3s. 6d. to £5 7s., loose box fittings £3 18s. 6d. to 5 ga., right hand or left hand corner fitting £2 17s. 6d. to £3 8s. 6d., manger and rack £3 8s. 6d. to £4 1s., corner manger £1 4s. and £1 12s., inside lip mangers £1 5s. and £1 10s., ditto trough £1, corner rack and seed box £1 1s., corner rack 13s., circular hay rack 9s. 6d., sample of surface drain 2s. 6d. per foot, teepiece for ditto 3s. 6d., angle for ditto 2s. 6d., mare pot 8s. 6d., horse pot 8s., stable grates and frames 2s. 6d. to 4s. 6d., channel grates and frames 1s. 10d. to 5s., stall plates 2s. 6d., per foot, ventilators £1 1s., corn bins £1 10s. to 3 ga., cow stalls £14, stable pads 4s., carriage set-ters 18s. to 25s., lanterns 3s. 9d. to 15s., chains 2s. 6d. to 3s. 6d., hooks 10s. 6d. to 35s., brush drainer 12s. 6d., fork rack 2s., forks 3s. 6d. to 7s. 6d., double harness fittings 60s., brackets 2s. to 35s., bridle hooks 6d. to 1s., pigtroughs 2s. 6d. to 3s. 6d. per foot, dog troughs 3s. 6d. to 7s. 6d., ventilators 1s. 6d. to 4s. 3d., air gratings 2s. and 2s. 9d., dung basket 4s. 6d., name plate 5s. 6d. to 7s. 6d., corn meter 7s. 6d.

COULTAS AND SON, Grantham, Lincolnshire.

Combined corn-dresser and blower £10, double box general purpose drill £38, single box seed drill £25, small occupation corn drill £18, broadcast manure distributor £14, steorage horsehoe £7 5s., horsehoe £7 10s.

COULTAS (JAMES), Grantham, Lincolnshire.

Corn dressers £7, barley hummeller £5, general purpose drills £25 and £39, steorage 90s., rye drill £26, root drill £28, Chandler's manure and seed drill £28, horse hoe £7 10s.

CRANSTON (JAMES), 1, Temple-row, Birmingham.

Showell's patent conservatory £75, greenhouse £35, ditto £28.

CROSSKILL (ALFRED AND EDMUND), Beverley.

Clodcrusher £16 10s., onehorse carts £11 to 15 ga., Hannam's harvest cart £14, pair-horse waggons £29 10s. to £37, Archimedian rootwasher £5 10s., portable farm railway 4s. per running yard, trucks for ditto £5 10s., turntable £5 10s., Ransome's "Victoria" reaping machine £38, bonemill £85, traction-engine waggon £80, iron liquid manure or water cart £17, pump and hose for ditto £5 15s., street watering cart £23, portable pump for water or liquid manure £5 15s., cart wheels and axle £7 and £8, circular pig trough 18s., Torr's fixture pig trough 65s.

CROSSKILL, W. (TRUSTEES of), Beverley.

Tenhorse portable steam engine £280, threehorse reaper £37, twohorse ditto £32, clodcrusher and roller £16 10s., Norwegian harrow 15 ga., field rollers £9 10s. to £15 10s., wheels and axles £6 10s. to £27 10s., onehorse carts 10 ga. to

18s., twohorse ditto £17 10s. and £18 10s., Hannam's harvest cart £14, with front and hind ladders £15 10s., light spring ditto £12 15s., market cart £12 15s., Whitcomb's ditto 18 ga., cranked axle ditto £14 15s., cattle cart £30, liquid manure or water carts £17 to £22 15s., portable pumps 5s 15s. to 7 ga., waggons £29 10s. to £33 10s., Lorry or Rally £30, portable farm railway 4s. per yard, farm railway trucks £4 10s., turntable £5 10s., corn winnower £8 10s., Archimedian root washer £5 to £7, bone mills £50 to £185, compound action mills £12 to £20, pig troughs 15s. to £5 10s., road watering cart £25.

CULLINGFORD (WM.), Edmund Terrace, Islington.

Cocoonnet fibre nets 8½d. to 6d. per yard, tarred and mineralised hemp 6d. per yard, batfolding nets 8s. to £1 5s., pairs of clapnets 15s. to £1 10s., spring birdtraps 7s. 6d. and 10s., lark nets 15s. to £2 5s., dragnets £1 10s. to £3 10s., fluonets £1 10s. to £2 10s., tremmel nets £2 10s. and £3 10s., casting nets 12s. to 30s., minnow casting nets 18s. to 30s., wool net 8d. per yard, rabbit boy nets 2d. and 3d. per yard, carp and tench net 15s., eel net 15s., milldam net 30s., shading net 9d. per yard, tree net £1, fruit and seed net 1s. 4d. per yard, poultry nets 8d. and 4d. per yard, rabbit and hare nets £1 5s. to £2 5s., rabbit flaps for ferreting 6s. per dozen, cricket net 18s., wagon rope 5s., wire netting 4d. per yard.

CURTIS AND CO., 16, College-street, Worcester.

Ladies' side saddle 5 to 14 ga., hunting saddles £4 to £5 10s., steeplechase saddles 4 ga. and £4 10s., race saddles £3 10s. and £4, boy's or girl's pad £3 3s. 3d., Spanish side saddle 3 ga., boy's pad £3, bridles 10s. 6d. to £2 10s., martingales 6s. 6d. and 7s. 6d., breastplates 16s. 6d. and 20s., harness 5 to 12 ga., solid leather munnle 15s., fire bucket 10s., hose piping 8s. per foot, machine strap £30 10s., carthorse collars 11s., nosebags 6s. 6d. to 12s. 6d.

CUTHBERT AND CO., Newton-le-Willows, Yorkshire.

Hussey's reaper for either one or two horses, with high travelling wheel and patent conical surface to remove the side strain, £22; twohorse ditto £24.

DAY (BENJAMIN), Quay-street, Worcester.

Bensine petroleum grease solvent, Mecca lubricating and petroleum burning oil and wax candles.

DODGE (GEO. P.), Dowgate Hill, London, E.C.

Ceils of vulcanised india rubber bands £3 2s. 6d. to £3 10s., gutta percha band 60 feet long £5 10s., india rubber hose £1 10s. to £2; double-texture covers £1 11s. 2d. to £3 14s. 9d., waterproof horse loin covers 10s. 6d. to 15s., grain drill tubing 1s. 9d. to 2s. 8d.

DRAV, TAYLOR, AND CO., Adelaide-place, London Bridge.

Onehorse cart £14, harvest raven 30s. extra; harvest wagon £22 10s., winnower £9 10s., set of harrows 7 ga., chaff cutters £3 10s. to £7, malt mill £4 10s., or crushing mill £3 15s. to 5s., weighing machines £2 2s. to £4 4s., oil-cake breaker 3½ ga., three row hand dibble £2 10s., liquid manure pump £3 10s., double-action Californian pump £7 8s., grindstone £2 12s. 6d., portable bench and vice £3 10s., forges and bellows £3 10s., cheese-press £3 10s., lawnmowers £8 to £8 10s., improved circular corn bins £1 5s. to £2, ditto flour bin £1 17s., American churns £1 8s. to £1 18s., metallic churns £1 2s. to £1 5s., garden seats 18s. 6d. to £2 12s. 6d., garden tables £1 16s. to £2 5s., garden arches £1 5s. to £1 12s., flower baskets 2s. to 8s., drinking fountains £18 15s., garden vases £3 to £9 10s., oak stand 10s. 6d., shoe brushes 14s. 6d. to 21s., grindstone £1, sack trucks 15s. 6d. to 21s., folding chairs 8s. 6d. to 16s. 6d.; forks, spades, and shovels, 2s. 4d. to 3s.; Boyd's self-adjusting scythes with wood handle 10s. 6d., with iron 12s. 6d., garden engine £4 10s.

DUNK (JOHN), 223, Shales Moor, Sheffield.

"Prince of Wales" oak chair £1 15s., Portland rocking chair £2 10s., walnut ditto 2 ga., revolver chair £1 15s., smokeroom chair £1 6s., cherry tree ditto £1 1s., small office chair 15s., cherry tree ditto 13s., common ditto 11s., nurse chair 12s.

EASTWOOD (JAMES), Blackburn.

Oval compound action churns, from one to twenty gallons £1 10s. to £4 17s. 6d.

EATON AND SONS, Thrapston.

Corn dressing machines 7 to 12 ga., combined turnip thrasher and horsehoe 7 ga., ornamental sheep cribs £1 2s. 6d., rackbar lifting jacks 3 to 5 ga., screw jacks £1 1s. to £1 7s. 6d.

ELLIS AND SONS, Oswestry.

Steam engines, portable eighthorse £230, sevenhorse £220; fixed sixhorse £150; combined thrashing machine £115; portable corn mill on metal frame £35; self-acting circular-saw bench £60 including 42-inch saw, £45 if without self-acting motion and boring apparatus.

FARMER AND BROUGHTON, Adelphi-street, Salford.

Hadfield and Atkin's brick and tile pressing machine, to dress 12,000 bricks per day, £100 with engine attached, and royalty of 6d. a 1000.

FERRABEE (JAMES), Brimscombe, Gloucestershire.

Clayton and Shuttleworth's fourhorse boiler £70; Giffard's self-acting water injector for feeding boilers £12, tenhorse fixed steam engine £125, ditto with boiler £105 extra, grinding mill £55, crane and alinge £5 10s., compound action mill £20; shafting, pulleys, and standards £12, chaff cutters £3 10s. to £12, chaff and litter cutter 16 ga., kibbling mill 5 ga., Budding's lawn mowers £4 10s. to £7; wedge spacers £5 and 5 ga., Clissold's chain belts 3s. 3d. to 4s. 9d. per foot, driving pulleys for ditto £10, driving clutch for ditto £3 10s., driving straps 7d. to 3s. 10d. per foot, Giffard's self-acting water injectors £19 to £40, British sewing machine 7 ga.

FISKEN (WILLIAM), Stamfordham, Northumberland.

Three-furrow steam plough and two self-moving anchor windlasses, ropes, and rope porters, £140.

FOSTER (WILLIAM), Lincoln.

Eight-horse portable steam engine £230, and combined thrashing machine with Goucher's patent beaters and improved smutter £115.

FOWLER (JOHN), 28, Cornhill, London.

Fourteen-horse set of steam-ploughing machinery, £396; ten-horse ditto, comprising engine and separate windlass, with belt riggers and couplings, 18 rope porters, 800 yards of steel rope, headland ropes, anchor, three-furrow plough, and five-tined cultivator, £580; set of ditto for continental use and for working for hire, consisting of two 12-horse self moving engines, with winding drums and coiling gear attached, 800 yards of rope, 10 rope porters, four-furrow plough, and six-tined cultivators, £1,220; four-furrow balance grubber and plough £117, three-furrow ditto £90 and £90, three-furrow plough £73, seven-tined cultivator £70, five-tined ditto and subsoiler £70, land presser £17; machine for harrowing, cultivating, &c., £80; drill for working alongside cultivator £33.

FREEMAN AND HARDON, Strangeways, Manchester.

Royal patent cake for cattle and sheep £12 10s. per ton; "original" economic food for calves and colts, and all animals sickly or old, £25 per ton.

FREER (JOHN), Rothley, Leicestershire.

Dibblers with six planting wheels of hollow iron £60.

FRITH (GEORGE), 53, Broad-street, Bloomsbury.

Scythe sharpeners 2s. and 2s. 6d., sheepshearer and scissor sharpener 1s., knife sharpeners 1s. to 2s., self acting mousetrap 1s. 6d. to 2s., magnetic hammers 1s. and 1s. 6d.

GARDNER (JOHN), Bradford-street, Birmingham.

Sausage chopping machine for steam power £68, for hand or steam £20, for hand only £12; sausage filling machines £1 15s. to £3 10s.; lard or hop press £3 5s.

GARRETT AND SON, Lelston, Suffolk.

Avon's locomotive traction engine for common roads, and for working any kind of stationary machinery, £420.

GIBBS (THOMAS) AND CO., Half-moon Street, Piccadilly.

Collections of specimens of grasses, English and foreign grain, seeds, and roots.

GIBBONS (P. AND H. P.), Wantage, Berks.

Portable steam engines, fourhorse £165, sevenhorse £215; combined thrashing machines, fitted with improved drum £83, with Goucher's drum heaters £112.

GILBERT (JOSEPH), Evesham, Worcestershire.

Combined portable thrashing machine £100 and £95, five-horse power steam engine £160, corn dresser £12 10s., grass and seed distributor 3 ga., five rowcup drill £7 10s., three-row corn drill £5, Phillips' hand reaper £5 (working 12 blades by rotary motion, cuts 20 inches wide, and delivers the corn into sheaves).

GILMAN AND SON, 148, Lancaster-street, Birmingham.

Specific for the cure of footrot in sheep 1s. and 2s. 6d. per bottle; fever and cough balls for horses 4s. per dozen; condition powder for horses 1s. per lb.

GLIDDON (JOHN), Williton, Somerset.

Open fire cooking apparatus suitable for a farm kitchen £18; steamers for cooking meat, fish, vegetables, &c., and large hot closet, £9 7s. 6d.; people's prize open fire kitchen range 10 ga.; "Vesta" cottage range and hot plate £4.

GLOVER (WILLIAM), Warwick.

General purpose waggon £36, improved farm cart £15 10s., general purpose cart £13 10s., cranked axle float £24, five-row corn drill £5 10s., three-row seed drill £6 10s., circular sheep crib or trough £1 5s. to £1 15s.

Goss AND PHENE, Rayne, Essex.

Taylor's root grater, having a disk with five gouge-shaped cutters punched in lines radiating from the centre, and bolted on a fly-wheel, for cutting roots into thin slips, 3 to 4 ga.

GOWER AND SON, Market Drayton, Salop, and Hook, Hants.

Corn drills, five to fifteen coulters £16 to £29; two-furrow drill pressers £6 to £10; three and six coulters manure drills £12 and £27; combined corn distributor, broadcast sower, and harrower £14; one and two coulters manure ridge drill £11 and £14, ditto for seeds £3 to £6 10s.; one-coulters drill for turnips, mangolds, carrots, &c., on the flat £3 15s., broadcast manure distributor £14, ditto for corn and seed 3 ga. £5.

GOUCHER (JOHN), Worksop, Notts.

Garrett's seven-horse power steam engine £225, sets of eight heater plates £3 17s. 3d. to £3 19s. 3d., six ditto 3 ga. to £3 12s. 9d., model of an improved patent boiler; patent apparatus for consuming smoke and regulating the pressure of steam boilers 6 ga.; Garrett's combined thrashing machine with Goucher's drum and concave £120; set of patent drum heads for 8-beater drums £1 2s.

GRANT (JOHN), Wester Hill, Kent.

Portable farm railway 15s. per rod; pair of sidings £5; barrow trucks, per pair, with screw brake £8 10s., if with false sides 10s. extra; ballast truck with self-acting tailboard fitted with screw brake £9, trestleable £2 10s.; single barrow truck £5 15s.; wheelbarrow with wheel under body £2.

GREEN (JOHN), Newtown Farm, Worcester.

Cultivating and couch destroying plough £6; cultivator and couch extirpator £6.

GREEN AND SON, 2, Victoria-street, London, E.C.

Five-horse power combined boiler and winding engine £145, two-horse combined vertical engine and boiler £85, two-horse horizontal engine and vertical boiler £45; lawnmower, roller, and collector, £3 10s. to £23; garden rollers £2 10s. to £7; morticing and tenoning machine £13; tenoning tool 30s., six tapers £3; balance-sawing machine £20.

GREENING AND CO., 81, Oxford-street, Manchester.

Horse, cattle, and sheep fence, 1s. per yard; ox fence 1s. 9d. per yard, hare and rabbit proof 1s. to 1s. 6d. per yard; sheepfold fence 9d. per yard, double mesh 1s. 6d. per yard; chickenproof poultry fence six feet high 2s. 6d. per yard; other poultry fence 1s. 9d. per yard; sufficiently strong wire park fence to turn deer, bullocks, horses, &c., 3s. per yard; garden fence 2s. 6d. per yard, machine-made Australian sheep fence £30 per mile; rolls of wire netting 6d. to 1s. 4d. per yard, strained wire fence 6d. to 1s. 3d. per yard, wire rope fence 1s. 11d. per yard; sheep, cattle, garden, and unfenceable hurdles 1s. 9d. to 6s. per yard; continuous bar fences 1s. 5d. to 2s. 6d. per yard; farm gates £1 1s. to £1 6s., pillars £1 to £1 6s. per pair; pair of wrought iron

entrance gates £6 10s., with handsome cast iron pier £8 10s., single entrance gates £8 10s., wrought iron garden wicket gate £1 15s. (including pillars and bolts for fixing them to stone), circular tree guard 15s., wire plant guards 1s. to 3s., expansion ditto 2s. upwards, ornamental wire garden border 9d. per yard, reclining chair in iron and wire 18s. 6d., corrugated lattice 5d. per square foot, easy arm chair 15s., patent portable cottage mangle £6 10s.

GRIFFIN, MORRIS, AND GRIFFIN, Wolverhampton.

Turnip manure £8 per ton, superphosphate £6 and £7, blood manure £8, manures for mangold wurzel £8, carrot and cabbage £8, bean, vetch, grass, and clover, £8; bag of prepared bones £7 10s.; manures for wheat, barley, oats, and potatoes, £8; for hops and gardening purposes, £10; bag of raw ground bones £7 10s., raw bone meal £8, boiled ditto £7 10s., ditto ground bones £7—all per ton; samples of phosphates for manufacturing purposes, ammonia, roots, cereals, corn, flour, and malt sacks, model ricksheet, water-proof cart covers and waggon covers and canvas—with no prices affixed; sample bag of nitrate of soda £16 per ton; horse cloths £2 2s. the set of four; feeding and fattening compounds £20 per ton; spices 6d. per lb., finely-ground locust £10 per ton.

GRIFFITHS (GEORGE), South Quay, Worcester.

Samples of various feeding articles, agricultural seeds, pure linseed cake, and cottonseed cake; with sample bags of Lawes' manures.

GRIFFITHS AND HYSLOP, Samson Walk, Worcester.

Rick, cart, and waggon covers, horsecloths, nosebags, halters, reins, and hunting flags, marquises, fodder cords, and twine.

GRUBB (EDWARD), Bromyard, Herefordshire.

Portable thrashing machine (Humphrey's) £93, McCormick's reaper £42, Richmond and Chandler's chaff cutters £2 10s. and £3 15s., three-furrow corn drill 4 ga., revolving barrel churn £4 10s., weighing machine £1 15s., oilcake breaker (Ransome and Sims') £1, reclining chair galvanised 18s., improved seed lips made of double tin plates 5s. 6d.

HADLEY (JOHN), Worcester.

Victoria sociable £120; reversible wagonette £50, plate glass enclosure £15 s reversible dogcart phaeton £45.

HALL (J. AND F.), Shambles, Church-street, Worcester.

Chaff cutters £2 12s. 6d. to £4 10s., Samuelson's turnip cutter with thirty knives £4, Pickley's turnip slicer with sickle knives £4, Bental's turnip pulper £5, anvil £4 10s., samples of iron of the New British Iron Company, galvanised iron chimney tops 18s. and £1, mowing machine £6 10s., rake with steel teeth 12s. 6d., wood rakes 7s. per dozen, horse nails 7d. per lb., lever cheese press £5, cart arms and pipes £1 6s. 6d. per pair, platform weighing machine £3 15s., vice 18s., tin watering pan 2s. 3d. to 4s., reaping hooks 2s. 3d., grass scythes 4s. 6d., wire dish covers 3s. 6d. to 5s. 6d., block tin meat hastener £1 10s., roasting apparatus £4 4s., pair of mail patent axles 12s., mincing machine 17s. 6d., thermometer 1s. 6d., quoits 3s. 6d. per pair, iron rings for croquet 3s. 6d. per dozen, American oven 10s. 6d., sheep folding hurdles 8s. 6d. and 4s. 9d., cattle hurdle 4s. 3d., wicket gate 15s., field gate £1 17s. 6d., neat garden fence 6s. per yard, tin box of rose nails 2d., grates 7s. to £6 10s., pan door scraper 3s. 6d., door porter 2s. 6d., iron pump £1 7s., cheese presses £2 10s. and £3 10s., garden chair £1 15s. 6d., hop presser £2 10s., grindstone rollers 2s. 6d. per pair, garden roll £2 6s., various troughs 2s. to £1 7s. 6d., combined hayrack and manger £1 12s., ventilator 7s. 6d., oven door and frame 9s., japanned sponging bath 15s., set of toilet furniture £2 10s., carriage jack 12s. 6d., cork screw 12s. 6d., coal vase 25s., japanned tin ware hot water jug 3s. 6d., can 5s. 6d., tobacco box 5s. 6d., spittoon 10d., wire netting 7d. per yard, perforated zinc 5d. per foot, cart springs 27s. 5d. per pair, Bramah's wine cellar's lock 12s. 6d., rose nails on cord 24s. per cwt., iron sack cart 12s. 6d., wringing machines £1 5s. to £2 5s., pair of garden shears 8s. 6d., axe 3s., spud with stick 1s. 6d., garden fork 1s. 6d., set of garden tools 15s., brass taps 2s., vent plugs 1s. 2d., circular saw £2 12s., files 4d., pit saw £1, balloon meat sales 4s. to 6s., forks and pikes 2s. 6d. to 5s., turret clock £42, cast steel spades 3s. and upwards, wrought iron cider screws £5 to £5 10s.

HANCOCK (J. AND F.), Dudley Park, near Tipton, Staffs.

Butter-purifying machines £2 2s. to £5, pulveriser ploughs £5 to £6 10s., cultivating plough £5.

HANCOCK AND SON, Fenton, Staffs.

Six horse power patent independent steam engine, the boiler rotating upon its axis at a slow rate, £150; malt-separating and crushing machine £175, adjusting corn screen £9 10s.

HANDLEY, (R. J.), 97, Moor Street, Birmingham.

French runner and bed millstones for grinding wheat £11 to £19; Derby millstone for grinding barley, beans, oats, &c., £4 15s.; metal prover £2 10s.; staff £1 5s.; box of mill bills 1s. and 1s. 3d. per lb.

HARDING (JOHN), Dursley, Gloucestershire.

Twelve-row Suffolk corn drill £26 15s., ten-row small occupation ditto £20, Garrett's lever horse hoe £21, broadcast manure distributor £19, five-row seed and manure drill £27 15s., ditto three-row for pony £16 10s., Taylor's lever horse hoe £12, Wood's two-horse grass-mowing machine £22, Cambridge's field roller £7 to £10, double cheese press 5gs., curd mill 25s., Tinkler's barrel churns £3 to £4 10s.

HARDCASTLE, (THOMAS), Gloucester.

Wringing and mangling machine 3gs.; washing ditto 6gs.

HARE AND CO., Essex Street, Strand, London.

Specimen illustrations of drawings and engravings on wood, of engines, implements, and machines, with list of exhibition prize medals English and foreign, of which electrotypes from the cuts can be furnished at 2s. to 5s.

HARROWBY AND SON, Bradford, Yorkshire.

Flour dresser £52, smut machine £36, metal prover and proof staff 3gs., Stevens' kneading machine £2 10s. to £15, Child's American revolving clothes dryer 30s.

HAYES (EDWARD), Stony Stratford, Bucks.

Ten-horse steam engine £270, designed to work the self-acting windlass for steam cultivation with 1,400 yards of best steel rope £155.

HAYES (JAMES), of Elton, Hants.

Portable grinding mills £18 10s. to £31 10s., flour dresser £18, portable straw elevator £53.

HAYES AND SON, Stamford.

Pair-horse wagon £44, one-horse van £36, lorrie £30; Scotch carts, one-horse £14 10s., two-horse 15gs., general purpose cart £13 15s., harvest cart with front and hind ladders £16 5s.

HAYWOOD (JAMES), Derby.

Horizontal fixed ten-horse steam engine £230, expansion apparatus £10 extra; portable eight-horse £230, four-horse £155, three-horse £120, two-horse £90, combined thrashing machines £30 to £83, chaff cutters £2 12s. 6d. to 10 gs., portable grinding mills with Peak stones £17 to £22, with French stones £22 to £27, Travis' cheesemaking apparatus £13 10s.; vases and pedestals—vases £1 3s. to £4 10s., pedestals 8s. to £2 10s., garden chairs 30s. to 50s., cast-iron tables 35s., cast-iron octagon chair to fit round a tree £7 10s.

HEADLY (EDWARD), Cambridge.

Straw carrier £30, counterbalance spring lever horse drag rakes 6 and 8 gs., wrought-iron cattle troughs £1 2s. to £1 15s.

HEMMING (HENRY MILLINGTON), Dunnington, Warwickshire.

Five-furrow drill for different grain £7 10s.; three-furrow ditto £5 10s.

HENSMAN AND SON, Leighton Buzzard.

Eight-row steerable corn, mangold, and turnip drill £20; six-row ditto £19; two-row land-dresser £8, with drill and hoes attached £13 10s.; ten-row press lever steerable corn and seed drill £25; two-row double-roller drill £9, one-row drill £6; chaff cutters, with three knives £14, with two knives £10.

HENTON AND SON, 7, Bridge-street, Lambeth.

Four patent elastic saddles £5 10s., lady's ditto 9 gs., New South Wales saddle £4 10s., race saddle £3 10s., safe side

saddle £7, bogskin saddle £3, set of rig or brougham harness £8 10s., thill and trace cart harness £8 10s., felt saddle cloth 6s., Melton saddle bands 12s., quilted pad £2, canvas tent £5 5s., patent lever bit £1 1s.; kersey horse clothing, consisting of hood, breast cloth, quarter cloth, pad cloth, and roller, £2 15s.

HEPBURN AND SONS, Long-lane, Bermondsey.

Stout double-leather belting 3s. 4d. to 11s. per foot, single-leather mill bands 2s. 1d. to 3s. 8d. per foot, ditto strapping 2s. 2d. to 2s. 6d. per lb., driving bands 2s. 1d. to 2s. 7d. per foot and 2s. 6d. to 2s. 10d. per lb., millband leather 2s. and 2s. 6d. per lb., lengths of leather hose £2 1s. to £5 17s., five buckets 9s. 6d. to 20s., tawed laces 10s. to 40s. per gross, canvas hose 8d. to 10d. per foot, hydraulic cup leathers 1s. 6d. per inch.

HILL AND SMITH, of Brierley Hill, Staffordshire.

Patent harrows £4, Cartwright's self-relieving chain harrows £4 15s., stubbleparing skim and light scarifiers £5 and £6, heavier scarifier and broadshare £7 10s., horsehoes 3 gs., Crosskill's clod crusher £6 13s. to £13 15s., light land roller 10 gs., heavy land universal roller £18 10s., barley roller £3, Sir Thomas Sebright's cast-iron heavy roller £50, chaff cutters £2 10s. to £6 10s., sackholder and barrow £1 12s., sheep-racks £2 17s. 6d. to 6 gs., sheeptroughs £1 10s. to £1 15s., Prosser's pigtroughs 2 gs., improved pig troughs 19s. 6d. to 21s. 6d., circular ditto £1 2s., cattle drinking troughs 12s. to £3 5s., cattle cribs 2 to 3 gs., iron wheelbarrows £1 7s. 6d. to £1 15s., heating barrow for tar £3, black varnish 1s. 6d. per gallon, gameproof wire netting 3d. to 1s. 10d. per yard, sparrowproof netting 3d. to 4d. per superficial foot, new ornamental corrugated galvanised netting 1s. 6d. to 2s. 6d. per yard, portable forge 5 gs., smith's workbench £2, iron arms and boxes for carts and waggons £1 8s. per cwt., ornamental cast-iron garden seats 17s. to £2 7s. 6d., cast-iron table flowerstand £1 10s., garden seats with wood back and seat 15s. to 20s. 6d., lawn mower and roller £4 12s. to 14 gs., wire garden arch 2 gs., garden bordering 6d. per foot, vases £3 to £3 13s., and pedestals £1 to £1 15s. Underhill's gameproof cattle fence 9d. to 2s. 6d. per yard, circular seat to fit round trees £2 15s., ornamental garden stakes 3s. 6d. to 30s. per dozen, standards 4s. 6d. to 8s. 6d. per dozen, gameproof plant guards 18s. to 30s., tree guards 12s. to £1, stall divisions £1 12s. 6d. to £7, loose box 6s. 6d. to 14s.; posts, spandril racks, mangers, water troughs, stable guttering, horsepots, ventilator and air bricks, stench traps, corn bins, stable-buckets, and corn servers; portable iron furnaces for cooking cattle food £2 15s., verminproof rickstands £4 7s. 6d. to £23 17s. 6d., pillars and caps for wood top 2s. 8d. to 3s. 6d., field gates with posts £1 5s. to £3 10s., entrance gates and pillars £3 13s. to £22, wicket gates £1 5s. to £2 5s., Lynne's field stiles £2 10s., sympathetic level crossing railway gates £20, sheep and cattle hurdles 3s. 3d. to 5s. 9d., ornamental undimbleable hurdles 5s. 3d. to 7s. per yard, gameproof ox hurdles 5s. 3d. per yard, garden hurdles 2s. 10d. to 3s. 6d. per yard; wire fence materials comprising continuous cattle, ox, deer, and sheep fence 1s. 8d. to 2s. 9d. per yard; galvanised cable strand wire from 32s. per cwt., solid wire in long lengths 10s. 9d. per cwt., straining pillars and stays from 28s. 6d., standards from 9s. per dozen, machine-made staples 10s. per 1000, box of tools for erecting strained wire fence 2 gs., wrought-iron galvanised corrugated farm shed 20 feet wide by 100 long £50 and £65.

HOBDAV (EDWARD), Sansom-street, Worcester.

Wire garden tables 10s. to £1 10s., flower stands 10s. to £3, suspending baskets 3s. 4d. to £1 15s., garden seats 10s. to £2, chairs 17s. and £1 8s., folding stools 14s., garden arches 15s. to 40s., diamond lattice 2s. 3d. per yard, fencing 1s. 6d. to 2s. 9d. per yard, peg lattice 3d. to 7d. per yard, rat traps 2s. 9d. to 6s. 6d., fish traps 18s. to £1 2s., and screen 28s., mortar screen 26s., riddles 1s. 6d., machine ditto 30s., meat safe £2.

HOCHKINS (JAMES), Hanford, Worcester.

New grass mower to be worked by one horse, and to cut from 10 to 12 acres per day, the knives being sharpened by their own friction, £20.

HODGETTS AND SON, Moreton-in-Marsh, Gloucestershire.

Rickcloth with poles, pulleys, and ropes, £14 5s.

HODGSON AND Co., Stourbridge.

Collection of spades, shovels, draining and other tools; cast-steel digging, manure, hay, and other kinds of forks.

HOLLIS (DAVID), Stow-on-the-Wold, Gloucestershire.

Hand corn-dressing machine fitted with nine-wire sieves £15, fitted with seven ditto 10 ga., nine-row imperial Suffolk corn drill £20.

HOLLIS AND SON, Witney, Oxon.

Winnowers £10 10s. to £12, with Boby's screen £18 6s. to £15, Suffolk drill £29; general purpose drills, five-row £9 10s., three-row £8; combined over-row hand drill for small seeds and beans £3 10s.

HOLMAN (STEPHEN), 18, Cannon-street, London.

Britannia double-action pumps £1 to £10; double-barrel pump, irrigator, and fire engine, mounted on wheels and fitted with unions, £15; three-inch patent double-action steam power pump £14 5s., four-ton hydraulic lifting jack for portable engines £8 10s., Tangye's hydraulic punching bear £14, screw jacks £1 3s. to £1 10s., windlass jack £6 5s., crabwinch with break £8 15s., sluice valves £1 9s. to £1 11s. 6d., galvanized pails 2s. 6d.; Weston's differential pulley blocks £2 5s. to £11 2s. 6d.; indiarubber hose pipes from 1s. 9d. per foot, union and branch pipes from 7s. 6d. each.

HOLMES AND SONS, Norwich.

Eighthorse portable steam engine £240, hand corn dressers £4 to £11, corn, chaff, and seed separator £8 10s., clover and shearer £50, combined thrashing machine £110, barley hammer £4 10s., seed drills and for manure 14 ga. to £21, one and seed drills £19 to £36 16s., small seed drill for 28 rows £22 10s., extra barrel for sainfoin £2 10s., ridge roller tiling machine £8, manure distributor 14 ga., broadcast one and seed sower £9 10s., two-row handbarrow drill £2 15s., one-row hand drill £2, circular-saw table with 36-inch saw £26 10s.

HORNBY AND SONS, Grantham.

Steam engines, tenhorse fixed £245, portable twelvehorse £225, eighthorse £235 and £240, corn-dressers £8 to £13 10s., rotary screen £9 10s. to £15, combined thrashing machines £98 to £115, turnip cutters £4 2s. 6d. to £1 10s., not pulpers £4 12s. 6d. to 6 ga., corn and seed drills 24 5s. to £44 2s. 6d., four-row seed drill £26 10s., eight-row small occupation drill £19 5s., forecarriage steersage £1 10s., horse hoes £1 10s. to £14, whippetrees 17s., wrought iron ploughs £2 10s. to £5 2s. 6d., plough with wood beam £3 17s. 6d., double furrow ploughs £8 6s. to £7, digging or moulding ploughs £4 10s. and £5, washing machines £3 to £5 10s., combined washing, wringing, and mangling ditto £5 10s. to 10 ga., wringer and mangler £3 10s. and £4, indiarubber clothes wringers £1 to £1 5s.

HOUSE (JAMES), Market Lavington, Wilts.

Improved crushing mill, capable of riddling the hardest granite £3 10s.; ditto for steam power, with two sets of rollers, for crushing granite to dust, cements, artificial manures, and other materials £25.

HOWARD (JAMES AND FREDERICK), Bedford.

Apparatus for cultivating land by steam power, comprising a tenhorse double cylinder portable steam engine, patent windlass 1400 yards of steel wire rope, double-action cultivator, with all necessary snatch blocks, anchors, rope porters, &c., £520, without engine £220; double action three-furrow steam plough £50, four-furrow ditto £60, double action steam cultivator £18, double action steam harrows £20, haymakers £15 to £17, horse-rakes £8 5s. to 10 ga., scarifiers 7 ga. to £10, expanding horsehoes £2 15s. to £3 15s., a variety of ploughs £2 10s. to £8 10s., plough sledges 8s. 6d., dynamometer 3 ga., whippetrees 17s. 6d. to £2 10s., sets of harrows £2 10s. to 6 ga., harrow carriage 30s.

HUGHES AND SONS, Great Dover-street, Southwark.

French runner millstones £12 10s. to £18, bedstones £12 to £13 10s., flour dressing machine £26 10s., nut machines £15 to £30, iron prover £2 15s., mahogany staff £1 15s., machine brushes 1s. 6d. to 2s. 9d. per foot, pulley blocks £1 5s. to £4 the set, corn measure £1 15s. to £4 5s., mill bands 2s. 1d. per foot, sack barrows 16s. to 20s.

HUMPHRIES (EDWARD), Pershore.

Hand corn-dresser £10; combined thrashing, shaking, riddling, barley-horning, winnowing, and sacking machines, £83 to £93; sixhorse power portable steam engine by Shuttleworth £200, portable clover seeding machine £30, cider mills £15 and £30, chaff-cutter £12, seventine scaffer £8, Cambridge's clod crusher £11, pair of cider press screws £6, horse hoes £4, set of onehorse harrows £2 10s., haymaker £10, riddle £3, lifting jack 25s.

HUMPHRIES (THOS.), Stratford-on-Avon.

Sets of harness £4 10s. to £9 10s., hunting saddles £4 to £4 12s. 6d.; bridles, double-rein £1 10s. 6d., Pelham £1 5s. 6d., hunting snaffle 16s.; bridle bits, stirrup irons, pony bridles, whips, leather watch guards, horse rugs, railway wrappers, and dog biscuits.

HUNT AND PICKERING, Leicester.

Variety of ploughs £3 10s. to £4 17s. 6d.; moulding plough, horsehoe, and scarifier combined, £3 3s., one-row horsehoe with three times £2 2s., turf and stubble paring plough £5 10s., sets of harrows £2 7s. 6d. to 4 ga., steersage horsehoes £5 10s. to £8 10s., cast steel hoe feet, shares, points, spuds, &c., from 1s. 3d. to 3s. 6d., one-row seed drills £2 12s. 6d. to £6 10s., two-row ditto £6 10s., eight-row corn and seed drill 17 ga. field rollers 10 ga., bundle of angle twitch rakes 3s. 6d., each with handles, twohorse-driving gear £14 10s. to £16 10s., disc root pulper £3 15s. to £6, chaff-cutter 10 ga., kibbling mill 8 ga., oilcake breakers £3 5s. to £6 5s., turnip slicers £3 15s., cornercrushers £4 7s. 6d. to £7, malt grinding mill £5 15s., sack barrows 12s. 6d. and 13s. 6d., link whippetrees 12s. 6d., Bailey's chaff-cutter £12, with 18-inch mouthpieces £18, Leicester garden seats 15s. to £1 10s. 6d., garden tables £1 5s. and £1 10s.

HUNT AND SONS, Brades Works, Birmingham.

Scythes 8s. 6d. to 5s., chaff knives 3s. 6d. to 5s. 6d., thatcher's knives 2s. to 4s. 3d., hay knives 3s. 3d. to 8s., reaping hooks 1s. 4d. to 2s., trowels 1s. 3d. to 2s. 9d., shears for hedges and grass 4s. to 9s. 6d., hayforks and manure forks 2s. 4d. to 6s., bill hooks 1s. 11d. to 3s. 6d., brushing and plashing hooks 2s. 8d. to 4s. 3d., hoes 6d. to 2s. 6d., breast ploughs and irons 2s. 4d. to 8s., cleavers 2s. to 8s. 6d., knives 1s. 6d. to 4s.; mill bills, cheese tasters, and butter boxes, 2s. to 5s.; garden rakes 1s. 1d. to 5s., spuds and weed hooks 6d. to 4s., garden tools 10s. to 20s. the set, axes 1s. 3d. to 6s. 6d., hatchets 2s. to 4s. 6d., mat-ticks and pickaxes 2s. to 2s. 3d., hammers 1s. to 3s. 6d., edge tools 7d. to 3s. 3d., augers 7d. to 3s., shell boards for ploughs 7d. per lb., spades and shovels 1s. 8d. to 7s. 6d., grafting and casting tools 3s. to 3s. 8d., draining tools 8s. 4d. to 6s. 6d.

HUNT (T. R. AND R.), Earl's Colne, Halstead.

Corn dresser 8 ga., disc rootgraters £4 10s., clover and trefoil seed huller £46, one and two-horse gear 11 and 14 ga., oilcake breaker 8 ga., single and double action turnip cutters £4 10s. and £5 10s., rootpulpers £4 10s., Moody's turnip grater £4 10s., one-row cup drill £2 10s., cloverseed barrow drill 8 ga., Essex scythe 11s. 6d.

JAMES (ISAAC), Cheltenham.

Liquid manure distributors £18 to £25, galvanized iron manure pump and suction pipe £4 6s., flexible suction pipe 3s. per foot, portable liquid manure pump £4, combined washing, wringing, and mangling machines £6 to £10.

JOHNSON AND WHITTAKER, Leigh, Lancashire.

Marshall's 2½ horse portable steam engine £105, 4-horse horizontal £46, chaff cutters £6 10s. to 10 ga., treble-action pulper £7, chaffcutters £2 5s. to £12, root cutters £4 10s. and £5 10s., root pulpers and slicers £4 5s. to £7, oilcake mills £3 15s. to £5 17s. 6d., onehorse gear £11 10s., two-horse horizontal steam engine with metal foundation plate £25, wringing and mangling machine 3 ga. to £4, lawn mowers £4 10s. to £6, garden rollers £1 18s. to £5, garden chairs 19s. 6d. to 2gs.

JOHNSTON (PHILIP), 290, Oxford-street, London.

Churns from 16s. to £4, pulley blocks 25s. to £4 the set, corn measures £1 15s. to £4 5s. per set, millbands 1s. 8d. to 2s. 1d. per foot, sack barrows 16s. to 20s.

JONES AND BOWN, Worcester.

Cooking ranges £8 10s. to 50 ga., Stevens' sprung stoves £22 10s. to £25 10s., burnished-steel fenders £9 10s. and £10 10s., garden chairs 18s. 6d. to £1 15s., marble chimney pieces £22 10s. and £35, Green's lawn mowing machines £6 10s. to £8, Budding's lawn mower with Manwaring's silent working wheels £7; hip, Malvern, and other baths, 21s., 35s., and £10; Leach's combined washing, wringing, and mangling machine £9; Leach's barrel churn £4; Bradford's washer, wringer, and mangle 8gs.; his acorn clothes wringer £1 5s., garden chairs 10s. and 12s. 6d., game netting 4d. to 9d. per yard.

JONES (JOHN MILTON), Gloucester.

Composition for waterproofing, softening, and preserving leather 1s. per tin box; specific for footrot 2s. per bottle.

KELL (S. A. AND H.), Gloucester.

Corn dressers £6 to £7 9s., manure distributor £12, turnip and mangold drill 5 ga., corn drills—three-row 5 ga. to fourteen row £28 5s.; £31 3s. for a thirteen lever drill with steering, and fitted with cogging apparatus at both ends for heavy lands; £30 8s. including boxes and tins for clover sowing with the twelve-lever corn drill.

KITMER (BENJAMIN), Falslow, Lincolnshire.

Corn-dressing machines and blowers combined £9, to be worked for either dressing or cleaning £8 10s.

Laurie (John), Rochdale-road, Manchester.

Chaff cutters (Gregory's) £2 5s. to £10, stubble skimmer £5, cultivator £6, drill harrow £2, cotton hoe £3 10s., paint crushers £5 to £9 10s., intermediate-motion churns £3 15s. to £4 5s., Radcliffe's wringing and mangling machines £2 12s. 6d. to 3gs., hand truck 30s.

LEE AND CO., Church Gate, Leicester.

Portable steam engines, eighthorse £200, 2½-horse upright £50; traction engines, eighthorse £300, tenhorse £380, portable four mill £34, portable brick press £15, haymaker 12 ga., horseshoe £7 5s., gaspipe plough £4 10s., general purpose plough and subsoil loosener £5 17s. 6d., oscillating harrows £4 7s. 6d.

LEIGH (J. S.), Luton, Beds.

Plan of farm buildings.

LEWAL (GABRIEL), 5, Philpot-lane, London.

Heating and ventilating apparatus £3 and £5.

LOOMES (EDWD.), Whittlesey, Peterboro'.

Brick and tile machine to make from 18 to 20 thousand bricks and from 28 to 30 thousand two-inch pipes in ten hours £120; Headley's steam engine £250.

MACKINDER (HERBERT), Mere Hall, Lincoln.

New implement for separating potatoes into three sizes—for eating, seed, and pigs, £12 12s.

McKENNIE, CLUNES, AND HOLLAND, Worcester.

Wilson's piston and ring for locomotive engines 16s. 6d. to £2 5s. 4d., garden engine, £4 10s. to £8, bottling machine £3, churn 30s., garden seats and chairs £1 5s. to £2 5s., cast-iron fountains £5 to £12, refrigerator £6 15s.

MACNAUGHT AND SMITH, Worcester.

Varnished agricultural cart, with lamps, apron, and wings £25; Whitworth and Malvern dogcarts £55 and £45; four-wheel dogcart, with parcel case, lamps, and lever-break £55; light Hansom cab £105, waggonette £110, crescent landau £210.

McNEILL AND CO., Bunhill-row, London.

Asphalte roofing felt 1d. per square foot, bituminous felt for granaries 1d. per foot, dry hair felt to counteract the influence of frost 7d. to 1s. 3d., the sheet of 20 in. by 24 in., patent rubber compound for high pressure steam joints 8d. to 1s. the set of sheets, several models and specimen framing of roofs of asphalte.

MAPPLEBROOK AND LOWE, Birmingham.

Chaffcutters £2 5s. to £3 15s., weighing machines £2 5s. to £24, pair of stand scales 12s. 9d. to 14s. 9d., corn drills £20 and £24 15s., Garrett's lever horseshoe £19, Taylor's ditto

£16, Garrett's tanrow corn drill £20, Chambers' sevenrow seed and manure drill £30 7s. 6d., Chambers' broadcast manure distributor £19, Garrett's three-row seed and manure drill £16 10s., Mercote-balance tormentors 45s. and 50s., chain harrows £1 15s. to £3 10s., oilcake breaker 3 ga., turnip cutters 4 to 5 ga., horseshoe £2; rack, manger, and water trough £3 5s.; wood whippetrees 9s. 6d., iron 10s. 6d. per set; cast iron stable furniture £4 2s. 6d. complete, mangers 5s. 6d. to 35s., portable forge 4ga., anvils 28s. per cwt., black staple vice 3½d. per lb., pair of arms and boxes 28s. per cwt., mail axles with long bolts 25s. and 27s. 6d., portable furnace £1 13s. 6d., liquid manure pumps £2 12s. 6d. to £3 12s., brewers' hot presses 30s. and 40s., best annealed iron fencing wire 12s. per cwt. of 300 yards, wire strainer 2 ga., galvanised buckets 2s. 6d. to 3s. 6d., scuttles 3s. to 5s., seed hoppers 5s. 6d., cornbin 32s. to 44s., granary or warehouse crane with 30 feet of best chain £7 10s., hand roadscraper machine £3 10s., double action mangle 10 ga., cottage mangle £3 10s., linen press £2 15s., lifting-jack 26s., single lever cheese press 50s., portable soup boiler £3 10s., kitchen ranges £6 to £27 10s.; harness-room grate £2 5s., cattle troughs 24s. to 55s., six pairs of pulley blocks 8d. per lb., improved lifting jacks to raise 3 tons 3 ga. to £10 for ten tons, weather vane ornamented with arrowhead 55s., iron wheelbarrow 30s., iron sack carts 9s. 6d. to 16s. 6d., wood frame sack carts 12s. 6d. to 16s., set of imperial bound wood measures £1 12s. 9d., washing machine £8, patent stack borer 3 ga., sets of draining tools £1 3s. and £1 19s., bundles of spades 3s. to 5s. 3d., cast steel digging forks 3s. 9d. to 4s. 6d., manure forks 3s. to 3s. 9d., couch grass and other forks 2s. 11d. to 4s., shovels 24s. per dozen; hand hay drag rakes 8s. 6d. and 12s. 6d., fold gates and posts complete 50s. to 70s., gates only 18s. to 32s. 6d., carriage gate £5, farmers' earth borer 21s., miners' earth borer 3 ga., six pairs of vases and pedestals £3 10s. to £4 10s. per pair, four others £2 15s. to 6gs. each, ornamental fountain with three basins £4 15s., six pair of garden seats £1 12s. to £2 15s. per pair, garden stools £1 11s. per pair, garden tables 35s. to 42s., garden engines £2 to £5, garden syringes 4s. 6d. to 14s., tool chest £5 10s., vermin traps 5s. 6d. to 30s. per dozen, pheasant feeders 5s. to 20s., ladies' tools 3s. to 12s. per set, hurdles £19 15s. per ton, dynamometer £2 10s., spring balances 3s. 6d. to 5s. 6d., quails 4s. to 6s. per pair, stand of models.

MARSDEN (JOHN WOODHEAD), New Wortley, Yorks.

Fixed steam engines of three and four horse power £16 to £62, self-contained engines and boiler of threehorse power £84, sixhorse power boiler £70, steaming apparatus £12 to £21, hurdles 2s. 6d. to 6s. per lineal yard, cast iron palisading and railings 8s. to 14s. per cwt., wheatsheaf casting for ornamenting agricultural buildings £3 10s., bracket 30s., stable fittings £1 17s. 6d., horseshoes 3s. 6d. to 8s. per set, farm or garden chairs 5s. to 10s. 6d., wrought iron farm cistern containing 120 gallons £2 8s.

MARSHALL, SONS, AND CO., Gainsborough, Lincoln.

Portable steam engines, tenhorse £290, eighthorse £230 and £245, combined doubleblast thrashing machines £105 and £115, two-and-a-half horse portable steam engine £100, circular-sawing benches £14 to £34, screw lifting jacks 30s. and 2gs.

MASON (ROBERT), Alford, Lincolnshire.

Cattle weighing machine £10 10s., for sheep and pigs £5 10s., sack weighing machines for farmers £2 to £2 10s., merchants' £2 10s. and £4 10s., portable £4 10s., platform £10, dormant £12 10s., coal weighing machine 20s. to £1 10s., Scotch 2ga. to £3, butchers' £2 5s., seedsmen's £2 4s., sack barrow 10s. and 12s. 6d., cake breaker £3 5s., turnip cutter £1 15s., garden seats 14s. to £1.

MATTHEWS (EDWARD), Worcester.

Howard's double action haymaking machine 16ga., horse rake £8 5s., ploughs £4 14s. 6d. to £4 19s. 6d., sets of iron harrows 3gs. to £3 10s., horse power £12 10s., chain or web harrows £3 5s., Hornsby's plough £5 1s. 6d., Kell's £4 7s. 6d., three-row wheat drill £4 15s., two-row bean drill £3 15s., osier seed drill £3, horseshoe 2ga., sack cart 13s., Cross-hill's onehorse cart £14, scarifier £5, root pulper £5 15s. 6d., Bentall's bean kibbler 3gs., oilcake mill £4 14s. 6d., Gardner's turnip cutter £5 10s., corn kibbler £5, chaff cutters £3 15s. to £10, weighing machines 2gs. to £5 17s. 6d., cider screws

£5 10s., lifting jack 2gs., cheese press £3 10s., garden seat £1 15s., roll £2 10s., vane 8gs., lawn mower £7, washing machine and wringer 7gs., wringer 25s., bundle of forks and spades £3 15s., felt 1d. per foot.

MAYNARD (ROBERT), Whittlesford, Cambs.

Eighthorse power portable steam engine with safety fire-box £280; portable sifting chaff engine for accompanying portable steam thrashing machine £39; ditto for three or four horse power 18gs., for one or two horse 15gs., spare riddle 14s.; spare knife wheel fitted with four knives £3 5s.

MELLARD (JAMES), Rugeley, Staffs.

Sixhorse horizontal steam engine £110, one horse power horseworks £9 10s., pulpers 4gs. to £5 10s., oilcake breakers £2 15s. to £5, chaff cutters 2 to 10 gs., corn crushers £4 8s. to £9 10s., malt mill £5 15s., horsehoes £1 10s. to £3 10s., ploughs £3 10s. to £5 10s., plough sledges 7s. 6d., drag rake £3 10s., seed drill 6gs., chain harrow £3, curd mills £1 6s. to £1 14s., cheese presses £1 13s. to £3 18s., cheese stool 12s., field stile 2gs., carriage jacks 9s. 6d. and 11s., rustic garden chairs 18s. 6d. to £1 15s., sack barrow 9s., pig troughs 6s. 6d. to 15s.

MERRYWEATHER AND SON, 63, Long Acre, London.

Light steam fire engine to discharge 250 gallons per minute 180 feet high £385; hand fire engine £63, farmers' ditto £20.

MILFORD (GEORGE), Thorverton, Devon.

Farm cart £15, farm wagon £25, Salisbury twohorse prize wagon £24.

MILFORD AND SON, Thorverton, Devon.

Twohorse wagon for farm, road, and harvest purposes £27; three or fourhorse ditto £34; one-horse cart £15, one or two horse ditto £16 10s.

MOORE (EDWIN), 55, Upper Marylebone-street, London.

Scythe sharpeners and hay-knife sharpeners 2s. and 2s. 6d., deep shear and scissors sharpener 1s., patent knife sharpener 1s. and 2s., water-gauge fittings for steam boilers 16s. to 40s.; various steam cocks and gauge glasses; magnetic hammers 1s. and 1s. 6d.

MORGAN (S. D.), Brookport, Monroe County, U.S. (agents Ingle and Goddy, 37, King William-street, London).

Combined self-reaper and mower £40.

MULLINER (HENRY), Leamington, Warwickshire.

Light varnished wood Whitechapsels £31 10s., "Leamington novelty" (a light fourwheel dogcart) £94 10s., light Stanhope phaeton £63, improved carriage wheel, set of brown harness, and parts of wheels.

MUSGRAVE BROTHERS, Belfast.

Models of stall divisions, with barrier and ventilating ramp £5 2s. 6d. to £5 14s. 6d., without ditto £1 18s. 6d. to 2 gs. per set; manger fittings for a stall six feet wide £2 10s. 6d. to £6 6s. 6d., noiseless tying apparatus 18s. 6d., noisy ditto 8s. 6d., cut-hay receiver 12s. 6d., galvanised ditto 17s. 6d., hay grid 10s., loose box manger fittings £3 18s. 6d. including swing guards, glazed tiles for heads of stalls and boxes 3s. per square foot iron gutter for stable drainage 2s. 6d. per foot; harness brackets, single 38s., double 65s.

NALDER AND NALDER, Wantage, Berks.

Coradressing machines 10 gs. to £12, corn and seed separators £5 10s. to £12, corn screens £4 10s. to £9 10s., with blower £3 to £25, compensation finishing thrashing machine £100, machine-made rotary screens £2 to £4 5s., Belcher's plaiting extractor and hwn and pasture improver 7s. 6d., Reber's sixhorse portable engine £201 10s.

NEWMAN (JOHN), Northampton, Gloucestershire.

Wroughtiron six-bar field or farm gate £1 10s., and with pillars £2 14s., palisade gate 18s. to £1 8s.

NICHOLSON (WM. NEWZAM), Newark.

Corn winnowers for roughing, chaffing, and finishing £9 to £12, elevating apparatus for sacking corn 3½ gs., haymakers £10 to £21, tubular-shafted horse-rakes with steel teeth £7 10s. to £11 10s., handrakes on wheels £2 10s., universal-

ointed land rollers £9 10s. to £14 14s., oilcake breakers £3 to 10 gs., sackraising barrows 2½ to 3½ gs., combined weighing machine and sack barrow £5 10s., 2½ horse power portable steam engine on iron wheels £85, threehorse ditto on wood wheels £105, portable thrashing machine £25, fixed steam engine boilers £50, garden rollers £2 15s. to £12, cottage cooking grates £2 6s. and £3 10s., improved cooking range £14, if enamelled £20.

NORTH BRITISH RUBBER COMPANY, 56, Cannon-street West, London, E.C.

Sheets of indiarubber packing 2s. to 8s. 6d. per lb., machine bands of indiarubber and canvas in sets of three £4 14s. 6d. to £9 8s. 7d., coils of ditto belting 1s. to 1s. 7d. per foot, coils of delivery hose 6d. to 2s. 4d. per foot, ditto for fire engines 3s. 8d. per foot, and £3 15s. the coil of 40 feet with fittings, coil of 60 feet for garden engine £3 4s., coil of ditto with galvanised spiral wire £5 8s. 6d. for length of 12 feet, embedded suction hose for chemicals 8s. 8d. per foot, hand joint 11s. to 16s., indiarubber tubing 3½d. per foot to 9½d., piston packing 2s. 6d. per lb., washers or flanges 2s. 3d. to 3s. 3d. per lb., vulcanised elastic cord 5s. 9d. per lb., steam engine valves vulcanised 3s. 3d. to 3s. 6d. per lb., vulcanised overcoats 15s., Inverness capes £1, leggings 6s. 6d., sou'wester hats 3s. 6d., caps with capes 3s. 6d., fishing boots 18s., Napoleon and Wellington ditto 15s. and 16s. per pair, belt joinings, railway buffers, hydropulps 2 gs. to £5, double-action force pump on barrow £7 10s., cowmilking machines £2 and £2 10s., clothes wringers £1 to £1 10s., rotary knife cleaner £1, Holman's force pump £5 10s.

NYE AND CO., 79, Wardour-street, London.

Chaff cutters £1 4s. and £4 14s. 6d., Lloyd's flour mill £6 15s., mincing and sausage machines 1 to 7 gs., coffee and other mills 6s. to £1, rotary knife cleaners 2 gs. to £10 8s., garden engines £3 to £7.

OLDHAM AND BORTH, Kingston-upon-Hull.

Sixhorse double roller bone mill, with elevators £300, without ditto £165; single bone mill £47; bone dust mill £90.

PAGE AND CO., Bedford.

Various ploughs £2 2s. to £4, horsehoes £2 10s. to £4 10s., scuffers £5 to £7, field rollers £7 15s. to £9 10s., chaff cutters £2 10s. to 13 gs., linseed cake machine £3 15s., draining pipe and tile machines 13 to 17 gs., ditto and brick maker £20 to £70, horse-rakes £7 10s. to £10, sets of harrows £2 to £4 17s. 6d., whippetrees 11s. 6d. to £1 6s., drilling bench £7

PARKER (FREDERICK), Cambridge.

Two-wheel dog cart £39 18s., family cart £47 5s., luggage cart £31 10s., pleasure cart £28 5s., four-wheel dog cart. £57 18s., wagonette £63.

PARKES AND CO., Sutton Coldfield.

Sets of draining tools £1 10s. to £1 19s., bundles of solid cast-steel digging forks (3 to 6 prongs) 3s. 6d. upwards, 7 to 9 prongs 8s. 6d. each, 10 to 12 prongs for coke 14s. each, for malting 10s., for manure 3s. to 5s., for borders 2s. 6d., for couch grass 3s., for potatoes 3s. and 6s., boy's digging forks 3s., asparagus forks 6s., toy forks 1s. 9d., hay forks 1s. 9d. to 3s. 6d., unloading forks 3s. 6d., pitching forks 3s., potato shovels 6s. 6d., manure drags 4s., rootloading forks 6s. 6d., American pattern forks 2s., Parkes' pattern 4s. and 4s. 6d., cast-steel shovels 4s., others 2s. 2d., Gloucester, Hereford, and Cheshire spades 3s. each and upwards, hooks 2s., axes 1s. 6d., hatchets 3s., hoes 10d., miners' shovels 1s., spanners and wrenches 2s. 6d., sets of screw stocks and ties £2 5s. and £4 8s., ratchet brace £1 1s., machine knives 2s., cast-steel hammers 2s. per lb., files 1s. 6d., horticultural tools 1s. 6d. each and upwards.

PARSONS (GEORGE), Martock, Somerset.

Patent tenhorse power horizontal high pressure expansive condensing steam engine £245, without condenser £225, eighthorse £225, combined thrashing portable machine £96, portable grinding mill £65, seed crusher 10 gs., oilcake mill, 3½ gs., wheels and axles 10 gs., garden pump £2.

PAYNE (JOHN), agent for TRACHSEL AND CLAYTON, 4, Russell-street, Manchester.

Patent osone gas generator £17.

PEARSON AND CO., Leeds.

Steam and other washing machines £3 to £25, wringing machines £1 12s. to £3, sewing machines £4 10s. to £12.

PEMBERTON (ABRAHAM), Worcester.

Various brushes 1s. to 7s. each, and 10s. per set, leather waterproofing composition 1s. and 1s. 6d. per tin box, sponges from 1s., Rawling's shoe-cleaner 10s. 8d., chamois leather 1s. to 2s. 6d., brass paste 6d. per tin box, cocoanut-fibre yarn 4d. per lb., door mats 1s. to 8s. 6d., cider cloth 6s., hop cloth 3s. 6d. per yard, horsehair cloth 4s. 6d. per yard nail brushes 6d.

PENNEY AND CO., 16, Broadgate, Lincoln.

Expanding rotary corn separators 14 to 20 gs., screens £1 10s. to 12 gs., sack lifters £2 12s. 6d., washing machines £2 8s. to £5 10s. combined, mangles £1 1s., rosary and aviary 7 gs., meat safes £1 to £2, four stands 7s. 6d. to 2 gs., dish covers £1 4s. the set, folding chairs and stools 4s. 6d. to £1, cages 5s., warming stoves 10s. 6d., perambulators £1 5s. and £1 10s., peg latvies 3s. 3d. per yard, hanging baskets 2s. 6d. upwards.

PERRY AND SON, Bilston, Staffs.

Field gates £1 10s. to £4 15s., entrance gates £10 to £19 15s., entrance and side gate £8 10s., terminal pillar 10s., continuous fencing 1s. 9d. to 3s. 11d. per yard, wicket gate and pillars £1 15s., turnstile £1 17s. 6d., hurdles 3s. 3d. to 9s., strained wire fencing 1s. 1d. to 1s. 8d. per yard, straining pillars 25s. to 35s., set of tools for ditto £2, tree-guards 18s. 6d. to £1, plant guards 15s. to 60s. per dozen, garden stakes 6s. to 18s. per dozen, wheelbarrow 30s., portable sheeprack £2 5s., double sheep-feeding trough £1, vermin-proof rick-stand £2 15s. to £12 10s., wire netting 4½d. to 16½d. per yard.

PETERS BROTHERS, Stockport, Cheshire.

Chaffcutters, £2 10s. to £7; combined three-horse power engine, chaffcutter, turnip pulper and steaming apparatus £95.

PICKSLEY, SIMS, AND CO, Leigh, Lancashire.

Chaffcutters £2 5s. to £24, mills £4 7s. 6d. to £15, turnip slicers £3 15s. and £4 15s., root pulpers £4 10s. to £3, Gardner's turnip cutters £4 10s. and £5 10s., oilcake breaker £3 10s., bone-rasping mills £30 to £135, onehorse mower £20, twohorse £22 10s., onehorse reaper £20, twohorse £24, horse gear £8 and £11, combined thrashing machine £38, sevenhorse portable steam engine £200, threehorse £100, land roll £9, garden rolls £1 17s. to £4 17s., American horse rakes £1 12s. 6d. to £2 5s., grinding apparatus £6, lawn mowers £5 10s. to £15, garden chains 15s. to 2 gs., wringers and mangles £2 15s. to £3 15s., pig troughs 10s. 6d. to £3, hay forks 6s. 9d. to 16s., rakes 3s. 6d. to 12s. 9d.

PINFOLD (J. D.), Rugby, Warwickshire.

Wright and Green's prize brick and drainpipe machine to make 15 or 20 thousand pipes daily, with driving pulley, £55; self-acting brick-cutter for ditto £80; smaller brick and drainpipe machine to make 6 to 10 thousand pipes per day, for horse power £27, for steam £37; brick and pipe cutter for ditto £7 10s.

POWIS, JAMES, AND CO., 26, Watling-street, London.

Sixhorse high pressure steam engine £120, eighthorse portable £230, shaping machine £180; mortising machine £16, and boring £18, and tenon cutting £21; endless band sawing machine £38, circular-saw bench £60, grooving bench £40.

PREECE (THOMAS), Leominster.

Corn drills £20 and £25, horse rake £6 10s., scuffer £5 10s.

PRIEST AND WOOLNOUGH, Kingston-on-Thames.

Corn drills £21 10s. to £32 10s., broadcast manure distributor £19, horse hoes 12 gs. to £20.

PROCTOR AND RYLAND, Carr's-lane, Birmingham.

Manures at £8 per ton for swedes, turnips, mangolds, kohl rabi, wheat, oats, grass with light subsoil, potatoes, barley, peas, beans, and clover; for strong grazing land £7 10s. per ton; for mowing land £8 10s.

QUINTIN AND SONS, Cheltenham.

Bread making and pastry-mixing machine 30s., dough mixer for 21lb. flour 3 gs. for 56lb. 90s., picture of a group of Herefords £25, footrot ointment 1s. 6d., cattle cordial 2s. 6d., mange balls for dogs 2s. per dozen, churn to make 4lbs. butter 21s., washing, wringing, and mangling machine £5.

RADCLIFFE (T. AND F.), Pendlebury, Lancashire.

Gregory's patent prise chaff cutters fitted with patent bevil delay motion, for hand, horse, and steam power, 45s. to £10; horizontal steam engine with castiron bed, mounted upon strong iron frame, 14 gs.; patent wringing and mangling machines 52s. 6d. to 4 gs.; circular-saw bench fitted with saw and pulley complete £10; Laurie's intermediate-motion 22-gallon churn 85s.

RANSOME (S. AND E.) AND CO., 31, Essex-street, Strand, London.

Long's nonpoisonous specifics for cure of scab in sheep 4s. 6d. per gallon to 6s. for "concentrated," 2s. 8d. for "preservative" against ticks, 4s. for "eradicator;" also his "smearing salve" (sample, not for sale), his "footrot and general lotion" 1s. 3d. per halfpint, dressing cans 2s. 6d. each, and dressing fork for holding the sheep (not for sale) with specimen fleece of sheep so operated upon; Weston's differential pulley blocks 45s. to £5 3s. 4d., Schäffer's steam pressure gauges 45s. to 80s., his vacuum gauge for fixed engines 55s., also his hydraulic ram gauge 5 gs., and counting machine with four dials 53s. 6d., with six 67s. 6d., with seven 75s.; screwjacks for raising two tons 32s. to four tons 40s.; Lefebvre's cinematograph 35s. and 75s., and stand for latter with circle of degrees 40s.; Hansbrow's Californian pump used at the diggings for raising water 100 feet £6 10s.; Holman's Britannia pumps £1 to £1 15s.; domestic firepump £1 4s., Fountain's hydropneumatic pumps £1 1s. to £2, Hale's mincing machines 1 to 2 gs., Nye's ditto £1 10s. to 2 gs., Pullinger's "automaton" and "perpetual" mousetraps 2s. 6d. and 3s. 6d., self-acting caskstands 10s. 6d., Rawling's boot cleaners 10s. 6d., Bradford's clothes-wringer with india-rubber rollers 25s., Hornsby's ditto 1 guinea, Ransome's knife cleaner 1 guinea, model of Perreux's patent pump, brass water gauges for steam boilers £1 2s. to £1 10s., brass whistles 11s. and 19s., improved steam valve 1s. 6d., oil siphons 11s. 6d. to £1 3s. 6d., grease cocks, £3 per dozen.

RAWLINGS (JAMES), 10, Carlton Hill East, St. John's Wood, London.

Boot and shoe cleaner 10s. 6d., children's portable chair, 18s. 6d., sash raiser 4s. 6d.

RAYNBIRD, CALDECOTT, AND BAWTREE, of Basingstoke, Hants.

Specimens in sheaf and grain of the best variety of wheat, barley, and oats, as cultivated in the South of England; also of the "red nursery" wheat at 10s. per bush; newly introduced cereals; seed and dried specimens of clover, grasses, sainfoin, and other forage plants; oilcakes and cattle-feeding stuffs, and the most approved artificial and other manures.

REVES, BROTHERS, Westbury, Wills.

Chandler's drills £24 to £48, Chamber's drop drill 50s., manure distributor £10, broadcast sower £14, corn drills £17 10s. to £35, for manure and seed £11 10s. to £18, combined horsehoe and manure drill £7 10s., guano pulveriser £4 10s., portable liquid manure pump £5 10s., thistle destroyer, 10s.

REYNOLDS (JOHN), 15, New Compton-street, London.

Galvanised wire hurdles 4s. 6d. to 6s. 9d., wire game netting 6½d. to 11½d. per yard, wire lattice 1s. 2d. to 2s. per yard, strained wire fence 6d. to 1s. per yard, espalier fence 1s. 6d. and 2s. each, spiral wire work 3d. per square foot, galvanised wire strand 11s. 3d. per 100 yards, brushes for boiler tubes 8s. 6d. to 10s., eel traps 20s., galvanised wire sieves 1s. 6d. to 6s., metallic cane-pattern seated garden chairs 15s. each, folding ditto 18s., summerhouse table 30s., wire dish covers from 3s. 6d., treeguards 2s., spiral wire garden archways from 22s. to 50s., flowerpot stands 17s. 6d. to 36s., garden bordering 1s. 3d. to 1s. 6d. per yard, suspending wire flower baskets 1s. 9d. to 30s.

RICHARDSON (JOHN), Carlisle.

Corndresser £9, corn and seed separator £8 10s.

RICHMOND AND CHANDLER, Salford.

Prise and other chaff cutters embracing all recent improvements and adapted for steam or horse power £2 10s. to £17 6s., corn crushers with diagonally fluted case-hardened rollers revolving at different speeds £5 5s. to £11 6s., oat and bean crusher on same principle £15 12s.; driving gears, for one horse £14 10s., twohorse £16 10s., fourhorse £24; root washers, consisting of cylindrical cage working in a trough, and raised out of the water by curved racks £3 to £4 4s.; steaming apparatus £6 9s., Gilbert's patent sackholders £1 3s. and £1 12s., Clayton and Shuttleworth's fourhorse power steam engine £165, Hodgkinson's patent breadkneading machines £5 to £25.

ROBERTS (WILLIAM), Twyford, Hants.

Wrought iron plough £4 10s.

ROBEY AND CO., Lincoln.

Twelvehorse power double cylinder endless chain traction engine £500, combined double-blast thrashing machine £115, eighthorse portable steam engine £230.

RUCK (JESSE), 44, Jamaica-row, Bermondsey, London.

Models of an engine and of a washing machine; cases of horticultural articles and some for domestic use.

ST. PANCRAE IRON WORKS COMPANY, Old St. Pancras-road, London, N.W.

Full sized models of a loose box and stalls, stall divisions and loose box divisions; loose box door and fittings £1 12s. 6d., patent manger £4 7s. 6d., ditto and water trough 5 ga., horse manger and rack £2 17s. 6d., enamelled £4 13s. 6d., self acting rack £2 7s., stable gutter and capping 2s. 6d. per foot, horsepots 6s. to 16s., latch 12s. 6d., halter guides 10s. to £1 1s., paviers £4 to 7 ga. per 1000, clinkers 2 ga. per 1000, stall plates 2s. 6d. per foot, plates and rings 4s. 6d. and 5s. 6d., hinges £1 6s. per pair, washstand and top £1 7s. 6d., stove and boiler £2, saddle ailer 9s. 6d., harness horse £1 1s., harness brackets 8s. 8d. to £1 8s. 6d., harness room hinges, cased iron chair 9s., stool 6s. 6d., lanterns 2s. 6d. to 1s., stable buckets 3s. 6d. to 6s., corn bins 30s. to 3 ga., corn measures, sack truck 19s., corn sieves 3s. 3d. to 5s., carriage utter 16s., drying frame 25s., bit and stirrup case £1 13s. 6d.; stable grates and frames, name plates, and ventilators; hurdles 3s. 8d. to 8s. 3d., gates 5s. 6d. to 4 ga., posts for field gates £1 14s. to £2 10s., tree guards 17s. to 23s. 9d., garden chair 2s., registering turnstile with brass arms £38 5s., barrier 3s., rack, halter, and pillar chains; Scott's glass walls 12s. per foot run, corner manger 32s.

SALKELD (SAMUEL), 481, New Oxford-street, London, W.C.

Broadest seed sower 30s., washing machine 40s., wringing and stretching machine 30s., folding revolving clothes dryer 30s., American churns 30s. to 70s., solid-headed pick 48s. to 60s. per dozen, pocket gymnasium 15s.

SAMUELSON AND CO., Banbury.

D'Orray's patent selfraking reaping machines £35, Saxon and Ball's combined reaper and mower, with flexible beam £26, Ball's meadow mowers £21 10s. and £22 10s., patent mowing machines £16, double acting haymakers 13 ga.; Gardner's turnip cutters, single action for sheep, 90s. and £5 10s., for cattle, lamb plates 3s. 6d., and 6s. 6d. for cutting small pieces extra, double action £5 10s. and £8 14s. 6d., lamb plates 5s. and 6s. 6d. extra; Gardner's turnip slicer 90s.; Corbett's rootpulp machines 90s. to £6 10s. with pulley for steam power; chaff cutters for hand or steam power 45s. to £10 15s. with pulley; linseed cake breakers for hand or steam £3 to £5 10s. with pulley; same ditto to be worked by a boy 40s.; roller mills £5 to £8 15s., chain harrows 60s. to 80s., Cartwright's ditto 57s. 6d. to 75s., Budding's lawn mower 92s. to £3 15s., atmospheric churn 35s., Anthony's American churn 45s., garden seat 6 feet long 26s.

SANTOM AND CO., 99, Cheapside.

Double action lift and force pumps 80s. and upwards; Santom's wringing machines 25s. to 52s. 6d.; washing machine 3 ga., Hawes's clothes dryer 30s., egg beater 5s., apple parer 6s. 6d., magnetic hammer 1s., knife cleaner and knife sharpeners 1s. to 2s. each.

SAVORY AND SON, Gloucester.

Tenhorse double cylinder self-propelling winding engine for steam cultivation £430, twelvehorse ditto £455, Fowler's fourfurrow balance plough £80, Howard's five-tined cultivator and scarifier £21.

SAVORY (JAMES), Tewkesbury.

Sevenhorse power portable steam engine £210, combined thrashing double drum bolting and finishing machine £100, portable horsegear £10, cider mill £14.

SAWNEY (WILLIAM), Beverley, Yorkshire.

Combined corn dresser £5 10s. to £11 10s., ditto with cliver or hariff separator £7 10s., patent blower and screener £6 10s., potato riddler 90s., harrows 50s. to 81s., horsehooks 28s. to 42s., turnip cutter 35s., sack trucks 12s. 6d. to 21s., sheep rack and feeding trough £6, Weston's differential pulleys 77s. 6d., riddles 40s. to 50s., cinders sifters 60s. to 70s., Ellis's washing machines 30s. to 5 ga., napkin press 3 ga., wringer and starcher 30s., boot cleaners 2 ga. and 60s., churn 55s., grindstone 30s. to 50s., bootjacks 10s. 6d. to 21s., cut-flower stand 3s. 6d., Ransome's miner 21s., Baker's egg whisks 3s. to 11s., garden stool 4s. 6d., Ellis's knife cleaner 4s., game trap 8s., self-acting rat trap 7s. 6d., mouse trap 2s., boot holder 10s. 6d., smokeless room warming apparatus 6s., Kent's revolving clothes dryer 25s.

SBRAGG (THOMAS), Calveley, Cheshire.

Drain tilemaking machine £21, with sample pipes 17s. 6d. to £6 5s. per 1,000.

SEAMAN AND TIPPING, Lowesmoor, Worcester.

Excelsior harrows 42s. to £6 15s., ploughs 55s. to £6 10s., horsehoes 3 ga., three to seven tined cultivators £7 10s. to £11 roller and clodcrusher £7 to £10, horsehooks £7 10s. to £8 whippetrees 12s. 6d. to 17s. 6d., garden chair 21s.

SHANKS AND SON, 27, Leadenhall-street, London.

Twohorse stationary steam engine £65, lawn mowers 5 ga. to £22, Fleming's salting machine £13 10s., garden water barrow £5, model of peach-house, garden rollers 38s. to 55s., garden seats 18s. 5d. to 30s., spiral garden stools 4s. 6d., garden table £1 5s.

SHARMAN (WARREN), Melton Mowbray, Leicestershire.

Bundles of rakes 1s. 6d. to 15s., sheaths 5s. to 9s., iron and wood sack trucks 12s. 6d., poultry fountains 6s. to 15s., corn and flour bins 18s. to 25s.

SHUTTLEWORTH (JOHN), Hathersage, Derbyshire.

Pair of Peak millstones for grinding barley, oats, beans, and Indian corn £8.

SILVESTER (JAMES), 3, Sheffield-street, Lincoln's-inn-Fields, London.

Scythe sharpeners 2s. and 2s. 6d., sheepshear and scissors ditto 1s., knife ditto 1s. to 2s., self-acting mousetrap 1s. 6d. and 2s., magnetic hammers 1s. and 1s. 6d.

SIMPSON (ALEXANDER), 18, Snow Hill, Birmingham.

Simpson's farinaceous food for cattle, sheep, and pigs £23 per ton; feeding meal £9 10s. per ton; crushed horse corn £12 per ton; Beach's meal for feeding cattle £14 per ton.

SMITH BROTHERS, Thrapston, Northamptonshire.

Tenhorse double-cylinder portable steam engine £270, double action independent-tined haymakers 12 to 15 guineas, horse rake £7 15s., bean mill £2 10s., ditto and oat mill £4 10s.

SMITH (RICHARD), Worcester.

General collections in tubs and pots, of the principal species and varieties of the coniferae, or cone-bearing trees, also ornamental trees and shrubs for parks, shrubberies, lawns, &c., comprising the rare kinds, as well as those of new or recent introduction; choice greenhouse plants in bloom, and ornamental foliaged plants for conservatories, &c.; cut rose blooms of sorts suitable for the open garden; samples of agricultural and horticultural seeds of the most approved kinds for the farm and garden; samples of grass seeds for laying down land to permanent pasture, parks, meadows, sheepwalks, churchyards, cemeteries, garden lawns, and bowling greens, including mixtures for improving and renovating old pastures.

SMITH (WILLIAM), Kettering, Northampton.
Horse hoes with independent steering, from £5 10s. to £8 10s.; combined winnowers and blowers £8 10s. to 11 gs.

SMITH (WILLIAM), Woolston, Bucks.
Tenhorse power portable steam plough engine £300; steam plough windlass, and 1,400 yards of best steel wire rope, anchors, &c., complete, £192; steam power combined cultivator and drill £35; steam power cultivators £15 and £17; indiarubber driving band £7.

SMYTH AND SONS, Peasenhall, Suffolk.
Seed and manure drill £28, manure distributor £18 10s., seed drill £26, corn drills £26 15s. to £36 12s., Capt. Kaemmerer's broadcast sowing machine £18.

SOVEREIGN (L. L.), 88, Pentonville-road, London.
Combined plough, drill, and harrow £28, ditto scarifier and seed sower £18 10s., broadcast seed sower 15 gs., hand drill 2 gs.

SPEAR AND JACKSON, Sheffield.
Steel spades 3s. 10d. to 5s., shovels 3s. to 4s. 8d., forks 1s. 9d. to 18s., draining tools £1 6s. to £1 19s. per set, also 6s. each; fertilizers 3s. 9d. to 5s., cromes 4s., potato sieves 5s. 6d., hooks and bills 8s.; picks, mattocks, grubbers, hedging and grass shears, 4s.; cast steel shaped for plough breasts or mould boards 36s. per cwt. black, 44s. bright.

SPENCER (JOHN), Doncaster.
Reaper for either one or two horses £23, drag £7 10s., horse rakes £7 10s. to £8 5s., double breast plough £4, potato raising plough £3 15s., five-tined horse hoe £3 10s., combined ridging plough and horse hoe £3, farther combined plough £3 15s., chain harrows £3 15s. and £4, sack barrows £3 10s., horse rakes 2 gs. to £2 12s., carriage jacks £1, hand hoes £1 8s. 6d., stook lifters 10s.

SPIGHT (ISAAC), Glandford Brigg, Lincolnshire.
Horsehoes, tenrow, £17, nine row for working evenly on hilly ground £19, corn drill £19.

STALKER (JONATHAN), Castlegate, Cumberland.
Horsehoes £3 15s. and £4, landgrubbers £3 10s. to £3 15s., double ploughs £4 and £4 5s., potato lifter £6, turn-wrest plough £5, swing plough £4 10s., wheel plough £5.

STEEVENS (WM.), 6, Godolphin-road, Hammermith.
Combined fourfurrow steam plough and cultivator £85, threefurrow ditto £55; steam-cultivating apparatus, comprising in combination the new fourfurrow steam plough and cultivator, new windlass, anchors, 1,600 yards of steel rope, snatch blocks, rope porters, &c., £240; ditto threefurrow plough and 1,400 yards of rope, £320; Aveling's tenhorse traction engine £450, eighthorse portable steam engine £242, ropeporter 30s., smaller size 17s. 6d., set of harrows 7 gs.

STOKES (CHARLES), Leigh Sinton, Worcestershire.
Improved earthenware collars without hames 19s. to 21s.

SUMMERSCALES AND SON, Keighley, Yorks.
Chaffcutters £2 5s. to £4 10s., combined bean and cake mill £5, oilcake mills 2 and 3 gs., bean mill £2 10s., disc root-pulper 4 gs., turnip slicer £3 15s., box churns £1 to £3 5s.; combined washing, wringing, and mangling machine £4 10s. to £3 12s., wringing and mangling machines £2 10s. to £3 15s., washing machine £5, wringing machine £1, Baynes' lawnmower £2 10s.

SUTTON AND SONS, Reading.
Collections of agricultural and botanical seeds, grasses, roots; and also of grain grown in the colony of Victoria.

SYKES (HENRY), 67, Upper Thames-street, London.
Portable steam engines, eighthorse £225, two and a-half £70, lathes £10 and £42, grindstone and trough £4 5s., portable forge £3 10s., smith's anvil £3 10s., vice £1 2s. 6d., portable vice stand with vice £2 2s. to £4, drill pillar with braces and drill for iron work £2 10s., lifting jacks 5 gs. and £6, screwing tackle £25, set of smith's tools £10.

TASKER AND SONS, Andover, Hants.
Eighthorse steam engine (Shuttleworth's) £235, winnower £11, combined thrashing machine £120, barley horner £6

10s., nine-row corn and seed drill £31, twohorse thrashing machine £36 10s., harrows 75s. to £4 11s., two-wheel plough 70s. to £5 8s., corn elevators 5 to 6 gs., horse rake with steel teeth £8, plough shares 8s. per dozen.

TAYLOR AND CO., Salford.
Hexagon eccentric combined washer 8 to 10 gs., ditto and churn 70s., wringer and mangler 2½ to 5 gs., breadcutting knife 2 gs., tin boiler 35s.

THOMAS (CHARLES), Stratford-on-Avon.
Newland's flexible saddles £5 15s. to 6 gs., hunting saddles £5, side saddle, with quilted seat, safe leaping head, and Victoria stirrup £8 10s.; lady's patent safety stirrup 25s., curb Pelham 28s., gag roller ditto 30s., Weymouth bridles 26s. to 30s., snaffle bridle 14s., bit to cure young horses of rearing 13s. with martingale and neckstrap, suit of horse clothing 57s., bridle with Chifney bit 30s.

THOMPSON (P.), for the London Co-operative Oil colour Society, 65, St. George-street, London, E.

Improved paint mixed in a liquid state 5s. to 11s. per gallon according to colour; tereb oil 6d. per gallon; Portland cement colour 1s. per gallon; ruddle for marking sheep 14s. per cwt.; salt for agricultural purposes 2s. to 8s. per cwt.; saltpetre 46s. per cwt., soda crystals 110s. per ton, cart grease 24s. per cwt., oils 2s. 4d. to 4s. 9d. per gallon, sulphate of copper 22s. per cwt., white soft soap 4d. per lb., chloride of lime 14s. per cwt., rough plate glass 5d. per foot, strong sheet glass 1d. and 2d. per foot, glass lactometers 5s., glass churns 35s., glass pails for dairies 8s., milk tests 1s., siphons 1s. 6d., glass duckness slates 1s. 3d., countess ditto 1s., glass for orchard houses; fluted, enamelled, ground, and other ornamental glasses of every shade and colour stained and painted oxide paints, varnish, japan, tar, pitch, rosia, rice, starch, laundry blue, ball black lead, "apokatharticon," and tiles with embossed and coloured figures.

THOMSON (GEORGE), Stirling.
Light waggons, with reversible seats and lamps, for either one or two horses £94, if without roof £83; Scotch highly varnished oak shooting or market cart, with lasedwood shafts, lamps, and cushions, £26 5s.

TINKLER (ROBERT), Penrith, Cumberland.
Revolving barrel churns to make from 1 to 15 lbs. of butter £3 5s. up to making 4 to 120 lbs. £6.

TREE AND CO., 22, Charlotte-street, Blackfriars-road, London.

Cattle gauges, slide rule, draining level, horse standard measure, barometer, thermometer, and microscope.

TURNER (E. R. AND F.), Ipswich.
Steam cultivating apparatus, comprising a tenhorse self-propelling steam engine fitted with 800 yards of Hall's patent steel chain, self moving anchor, and Fowler's fourfurrow balance plough, £685; Dr. Ager's steam digger £85; portable steam engines—fourhorse £185 down to twohorse £95; combined thrashing machines £45 to £85; crushing, bruising, and malt mills £3 to £38; stone grinding mills £28 and £35, chaffcutters £7 and 10 gs., oilcake breakers 60s. and 70s., gear work and intermediate motion £14 10s., Dr. Ager's digger, pulveriser, and weed extirpator £40, without the digger 12 gs.

TURNER (GEORGE), 13, Rose Terrace, Fulham-road, London.

Sausage-making, suet-chopping, and general mincing machines 1 to 6 gs.; masticator to assist digestion 15s., coffee mills 8s. 6d. to 10s. 6d., egg and cream whippers 10s. 6d., churns one guinea, knife-cleaning machines from one guinea, bread making machines £2 10s., samples of domestic machinery from 1s., domestic articles from 2s. 6d., case of samples of Condy's disinfecting fluids and acids, fumigator 2s. 6d.

TUXFORD AND SONS, Boston.
Prize portable patent steam-engines, eighthorse, with inverted vertical cylinder, £250; twelvehorse, with two inverted ditto, £355; tenhorse steeple ditto £285; eighthorse steeple ditto £255; eighthorse steam engine with single vertical cylinder £335, sixhorse ditto £305, fourhorse £170, eighthorse improved, with horizontal cylinder, £240, without steam

jack and extra expansive valve £230, threehorse ditto £90, twohorse £70, onehorse £45; eighthorse fixed, with vertical cylinder, £200; combined thrashing machine known as the "rough chaffing machine" £90, ditto with Boby's screen £110; improved straw stacker 20 feet spout £45, without finding table £18 less; Appold's centrifugal pump £50, portable mill for steam power with Peak stones £45, self-acting circular-saw table £75, two others £30 and £14.

TWINBERRY AND CO., 53, Broad-street, Worcester.

Cathartic balls for horses, specific for distemper in dogs, veterinary medicine chest, dronches, mixtures, oils, ointments, essences, pastes, powders, fly-gall, and smearing preventive, Seltzer water, soda, potash, lemonade, and gingerette.

TYE AND CO., Lincoln.

Fixed and portable mills £31 10s., £36, £61, £65, and £136; crane for lifting millstones £6, French millstones 3 ft. 6 in. diameter £3, mill bills 1s. 2d. per lb., iron proving staff £2.

UNDERHILL (W. S.), Newport, Salop.

Portable steam engines, threehorse £120, sixhorse £180 and £200; thrashing machines, threehorse £100, sixhorse £100, ditto finishing machine £110, elevators 5, 6, and 10 ga.; cultivators, five-tined £1 10s. to eleven-tined £11 10s., ploughs £2 10s. to 4 ga., barrows £2 10s. to £3 10s., land rolls £8 to £12, seed drills £3 5s. to £4 10s., gapping drill 8s. 6d., horse hoes £1 5s. to £2 5s., grubbers £2 5s. to £2 15s., hay-maker 14 ga., horse rake £6, cake crusher £4 10s., hand cart £3 5s., tar-heating stove £1 12s. 6d., cow cribs £1 10s. to £1 15s., sheep racks 30s. to 40s., sheep troughs 15s. 6d. to 15s. 6d., sack barrows 10s. 6d. and 18s. 6d., cheese press £2 15s. to £5, spring hook £2 10s., specimen rolls of patent fence, tree guards, border edging, wickets and gates, draining pipes, presser bricks, common bricks, plain tiles, and blue stone for paving.

UPFILL AND SON, Birmingham.

Mail axle arms £1 0s. 6d. to £2 17s. 6d. per pair, Collinge's ditto £1 6s. 6d. to £2 18s. 6d., other arms 17s. 6d. to £1 6s., hurdles 3s. 5d. to 9s. 6d., garden fence 42 lb. 6s. 3d. to 74 lb. 10s. 6d., and 76 lb. 10s., continuous fencing 2s. 9d. per yard, hand gate 8s. 6d., wrought-iron gate £2, cast-iron pillars £2 10s. per pair, field gates £1 15s. to £3 5s., gate pillars £2 10s. per pair, entrance gates 6 ga. to £8 10s. per pair, cast iron pillars £4 15s. per pair, tree guards 9s. 9d. to 16s. 6d., garden chairs £1 4s. to £1 8s., corner hayracks 8s. 6d. to 10s., strained wire fencing 2s. 6d. per yard, straining standards with stays £2 8s. 6d., self-fixing standards 1s. 9d., garden chair with wood seat and back 17s. 6d., wrought iron barrack bedstead £1 2s. 6d.

WAIDE (WILLIAM), Leeds.

Barrel churns £3 to £4 10s., tub churns £1 5s. and £1 10s.

WALCOT (WILLIAM), 4, Pierpoint-terrace, Islington.

Sharpeners for scythes 1s. 3d., chaff knife 1s. 6d., and for hay and straw knife 1s. 6d., for domestic knife 1s. 6d.; magnetic hammer 1s.

WALLIS, HASLAM, AND STEVENS, Basingstoke.

Portable engines—Clayton and Shuttleworth's eighthorse £230, Brown and May's 8½ horse £105; combined thrashing machine (portable) £58 to £104 10s., fixed thrashing machines £55 to £81 8s., intermediate motion £8 18s. 6d., barley sower £4 15s., portable straw elevator £53, machine for drilling iron by hand or other power £5 10s. to £8 5s., gram and seed sower 2 ga.; iron ploughs—onewheel £3 3s. to £3 15s., two-wheel £4 7s. 6d. to £5 2s. 6d.; Harrison's presserwheel for attaching to plough £2 10s., iron drag barrows £4 to £5 per set; chain harrows £2 to £3 7s. 6d. per set, horsehoes £2 and £3 5s., horse rake £8 10s., sixrow seed and manure drill £31, garden seats with arms £1 1s. and £1 7s.; washing machines—Muggeridge's £3 5s. to £4 15s., Edmondson's £3 5s.

WALWORTH AND CO., Bradford.

Fourdressing machine £54 10s. and £32; grain, seed, and brewasher £32, smut machine and corn screen £30, ditto for small mills £12.

WARD AND BURMAN, Stratford-on-Avon.

Patent brick machine to make from 40,000 to 55,000 bricks per week £60; patent clot machine, to make 60,000 weekly, £35.

WARDEN AND CO., 12, London-street, London, E.C.

Norton's open lift pump, to raise 80,000 gals. an hour, with engine and boiler, £400; lift pump to raise 6,200 gallons an hour £28, 1,500 gallons £19 10s., 850 gallons 10 ga.; pair of four by eight inch ship's pumps £35; diaphragm water jet or handfire engine 3 ga.; ditto on wheels and with handle £3 15s.; double diaphragm pumps, to raise 300 gallons an hour £2 10s., up to 1,870 gallons £10.

WARNER AND SONS, 8, Crescent, Cripplegate, London.

Sevenhorse power engine £160, turnip cutters and mangold graters 4 to 5 ga., steam irrigator £100, steam pump for irrigation £30, pump for hand power 15 ga., irrigator for horse power £55, pumps of every variety from 30s. to £28, strong horse wheel frame £31 10s., cast iron engine frame with flywheel and handle 10 ga., ditto with brass force pumps and air vessel £27 10s., ornamental pump case £6, suction rose 7s. 6d., garden engines £2 15s. to £6 18s., conservatory pump £3 6s., board of syringes £1 1s., fire annihilators 2 ga., fire engines 3 ga. to £24, swing barrows £2 to £2 10s., fountain designs 5s. to 25s., sheep and cattle bells 12s. to 38s., the set, fumigator 25s., copper ditto 14s. to 18s., alarm bell mounted £5 14s., gong call £4 17s. 6d., well frame and pump £49, metallic string 10d. to 1s. 2d. per lb., the model of over-shot wheel £30, bundles of taper branch pipes 5s. to 45s., indiarubber hosepipe 5d. to 5s. per foot.

WARREN (SAMUEL), New Town, Ledbury, Herefordshire.

Onehorse gear, enclosed, £12 10s.; Ruston, Proctor, and Co.'s eighthorse power portable steamengine £225.

WEDLAKE AND DENDY, Hornchurch, Essex.

Doubleaction balanced hay machine 14 ga.; hay, horse, or stubble rake £7 10s.; improved horsegear and angular adjustable motion 13 ga.

WEIR (EDWARD), 142, High Holborn, London.

Summerscales' combined washing machines £7 and £8, other kinds £4 10s. to £5 10s., wringers and manglers £1 10s. to £3 10s., portable boiler 30s. to 50s., box churns £1 5s. to £3 5s., Eastwood's compound-action churns £1 13s. to £4 17s. 6d., metallic churns 16s. to 40s., sets of dairy utensils £2 5s. to £2 10s. per set, scales 7s. 6d. to £1 5s., weighing machines 16s. 6d. to £2 2s., Prussian spring balance 5s. 6d. to 12s. 6d., Kent's knife-cleaning machine 80s., set of domestic implements 6s. 6d., ladies garden tools 3s. 6d. to 8s. 6d., drawing levels 15s. to 30s.; irrigator and fire engine 7 ga. to 12 ga., sewing machines 14 ga. to 30 ga., small ditto 5 guineas.

WHEELER AND WILSON, 73, Bold-street, Liverpool.

Sewing machines £10 to 15 ga., and umbrella lock stands 4s. 6d. to £2 10s.

WHEELER AND SON, Gloucester.

Collections of seeds of cereals, grasses, and other plants illustrative of agriculture; and also of cereals and grasses in the straw.

WHITE (HENRY), Evesham.

Dresser and winnower £9 10s., three-row corn drills £5 to 6 ga., one-row drill £2 10s., five-row £3 10s., ditto cup drill £8 10s., extra barrels for beans 10s. each, two-row drills for beans and peas £4 and 5 ga.; drills for turnips and mangolds, one-row £2 7s. 6d., two-row £3 17s. 6d., two-row manure and seed drill £12 10s., single-action haymaker £11 10s., hand drag or steel rake 17s., curd breaker £2 7s. 6d.

WHITE (JAS. CHADNOR), 29, Liverpool-street, London.

Pair-horse carriage harness, fitted with patent tug for dispensing with the buckle, £28; single brougham harness, with patent rein-swivel, 13 ga.; silver-mounted single harness for dogcart 10 ga., ditto with brass and covered furniture 9 ga., parallel tandem bars £3 10s.

WHITE (JOSEPH), 7, Trinity-street, Southwark.

Spring lever valve oilfeeders 1s. 6d. to 4s., pneumatic save-all oilcans 6d. to 1s. 6d.; artificial dams for feeding sucking pigs, lambs, calves, and foals, 2s. 6d. to £1 1s., fliptrap mouse and rat traps 3s. 6d. to 10s. 6d., Knight's strong glass weather indicators 2s. 6d., Winton's hydro-pneumatic fire and garden

engines £1 1s. to £1 15s., crown leather 8s. 9d. to 4s. per lb., Preller's leather driving bands 8d. to 7s. per foot, sewing thongs and lashing laces 6d. to 4s. per dozen; laces for farmers', fishing, and shooting boots 3d. to 6d. per pair, spiral lathe bands 3d. to 9d. per foot, coils of half inch and one inch leather rope 6d. to 1s. 6d. per foot.

WHITEHEAD (JOHN), Preston.

Drainpipe, brick, and tile machine £14 10s. to £21, double-box ditto £28, for horse power £35 10s., combined clay-preparing ditto £140, rotary brickmaker or presser £45, improved ditto 16 gs., pipe socketer £13, iron pugmill £14, Edmondson's patent washing machine £7, galvanized wire netting 6d. to 9d. per lineal yard, black wire netting 5½d. to 6d. per yard.

WHITGROVE (JAMES T.), The Butts, Worcester.

Circular brougham with Collinge's patent axles £126, wagonette with reversible seat £75, light dog cart £34 15s., sporting cart £30, light pony park phaeton £51.

WHITMER AND CO., 70, St. John-street, London, E.C.

Chaff cutters 25s. to 20 gs., bean mills £2 16s. and £3 5s., corn crushers 55s. to £20, linseed ditto 95s. to £12, locust bean pulper £25, locust kernel mill £25, corn mill 90s. to £30, oilcake mill 4 gs., flour dressing machines £6 to £25, four mills £7 10s. to £30, sausage machines one guinea to £6.

WILLIAMS (JOHN ALLIN), Baydon, Wilts.

Combined roller, drag harrow, and chain harrow for steam power, £30; steam cultivator, £35; six wheel land presser for horse or steam power £20.

WILLIAMSON BROTHERS, Kendal, Westmoreland.

Portable fourhorse steam engine £130, for working portable combined thrashing machine £60, Professor Thomson's six horse power vortex turbine with fixed guide plates £45, his whirlpool centrifugal pump for lifting large quantities of water through moderate heights £28; twohorse thrashing machine with horse gear complete £23, machine alone, £18; improved straw shaker £5.

WILLIAMSON (WELBURN), 133, High Holborn, London.

Washing and wringing machines combined £5 10s. and £6 10s., ditto and mangling £3 to £12, wringing and mangling £2 10s. and £3 10s.; washing machine £3 10s., wringer £1, miscellaneous articles of indiarubber agricultural and horticultural.

WOOD (WALTER ABBOTT), 77, Upper Thames-street, London, E.C.

Grassmower for twohorses £22, ditto for onehorse £20, combined mower and resper £35, separate resper for twohorses £25, drop-slat-platform back-delivery resper for one horse £20.

WOOD (ARCH.), Barbourne Nurseries, Worcester.

Miscellaneous collection of seeds, shrubs, plants, &c.

WOODS AND COCKBIDGE, Stowmarket.

Pontifex's crushing roller mills £4 10s. to £12, corn-grinding mills £5 15s. to £36, Phillips's rootpulpers £3 12s. 6d. to £7 7s.; Gardner's turnipcutters, single section £4 10s., double £5 10s.; horsegear 9 gs.; onehorse power 11 gs. and 13 gs., twohorse power 16 gs.; Wood's mowers, onehorse £20, twohorse £22; oilcake breakers £2 12s. 6d. to £3 10s.; twohorse portable thrashing machines, with wheels £37, as a fixture £32; Phillips's poppy and weed extirpator £8 15s.; light onehorse cart £10; onehorse cart with jointed harvest frames £15, twohorse ditto £17; wheels and axle £8, chaffcutter £3 10s., Burrell's sixhorse portable steam engine £200, corn-grinding mills £22 and £49, roller, crushing, and grinding mills £10 and £14 10s., cabinet mangle £8 10s., asphaltum apparatus £17; collection of leather driving bands, hose, ropes, and buckets.

WORTH (SAMUEL LEAKE), 293, Oxford-street, London.

Duffield's churns 18s. to 25s., yoke with crest 10s. 6d., milk-pail 12s. 6d., carved bread platter and knife 12s. 6d., ditto butter plates 4s. 6d., butter prints 1s., milk pails 7s. 6d., butter runners 2s., paste rollers 1s. 6d., butter moulds 2s. 6d., butter beaters, knives, and slicers 2s.; cream bottles 3s. 6d., milkcans and measures 1s., razor strop 3s., knife-cleaner of buff leather set on edge 6s., fork ditto 2s., swordpolisher 1s., plate ditto 2s. 6d., knife and fork cleaner 35s., grate polisher 3s., barrel stand 8s., rose or aphid brush 3s., rotary carpet-sweeping machine 15s., knife sharpeners 1s., scissors ditto 1s., magnetic hammers 1s., glass cleaners 1s. 6d., sausage machine 16s., eggwhisk 3s., rollingpins with revolving handles 1s. 6d., breadcutting machines 7s. 6d.

WRIGHT (HENRY), Boston, Lincolnshire.

Stacking machine, or hay and straw elevator, for hand, horse, or steam power, to work in any direction within two-thirds of a circle without manual assistance, £35.

WRIGHT AND SON, Great Bentley, Essex.

Specimens of the British pasture grasses and seeds, agricultural seeds and roots.

YOUNG (J. and T.), Ayr.

Combined reaping and mowing machine with double driving wheels and moveable cutting part for escaping obstacles and crossing deep furrows, also folding-up platform, £24 10s.; double-drill turnip and mangold sowing machine either drop or continuous £6, single cheese-press £2 10s., double £4 15s., curdbreaker with working parts galvanized £2 5s., guano pulverizer with hinged door for passage of stones £3.

THE HORSE SHOW AT WORCESTER.

Colonel Cotton and his colleagues had been at work for nearly half-an-hour or more when we got to the ring, and only four or five blood sires were left in. Then they were down at three, and out came the orange, blue, and yellow Cambondo, of whom Tom Brooks was a great admirer, did not relish his defeat at all, and flatly refused to go back into his box. They bluffed him, but it was no use, and Colonel Cotton came to the rescue, and he was backed in at last. He was a fine big-limbed horse, and a good mover, but rather leggy and flashy. Although he had not shared the fate of Colonel Twomey's cattle, six miles on the average per hour, all the way from Lancashire, or of the Duke of Tyne, shunted for 13½ hours in one station, he had thoroughly hated his journey from London, and had done some long sweats in his truck, which had sadly pulled him down. Mr. Phillips didn't grumble at the decision, as his heart was with Neville the moment he saw him trot down the centre

with that beautiful balance-action of his, which fairly turned the balance. He has not very much quality, and might be improved on some other points; but as to the correctness of the decision there cannot, we think, be a doubt. It is action after all which carries weight, and here it was in perfection. In fact, his trot and the glide of the man whom we lately saw dropping down the Thames with nothing but his head out of water, scarcely making a ripple, and calmly smoking his pipe the while, under a tropical sky, are two of the sweetest bits of movement we remember to have seen except it be Newminster coming down from the bend before the St. Leger. In his day Neville was a fair race-horse, but not exactly a glutton, and it will be remembered that in one of his best races Aldcroft was so pressed to get the weight, that he took off his shirt. Cavendish is a very handsome horse, more like Vortex, Voltigeur's brother, than any of the Voltigeurget. He has become very mouldy

with age; but though his superior as a stand-still horse, he is far behind the winner when he is set going. It was curious to note how the queries raised during the walk and "stand at ease," as to why he should not have been first, seemed to ensue all around the ring, the moment Neville had followed him down the middle, which he did by virtue of his catalogue place. Rouble, one of Mr. Cookson's Doncaster yearling lot, is a pretty horse, and like all the Cosacks neat, and with a good back. Ancient Briton is loose and leggy. Plum Pudding's coaching top and quarters sent him to the right about. Malek was shelly and short, and Conscrip had shabby quarters, and a bad notion of going. Stampede was a big, level, sluggish sort of horse, and seemed to have given up those bad ways which caused him to be left at the St. Leger post. The class is, as a whole, an improvement on what we have seen there; but still the past is a low standard to try by, and the judges seem to have been rather good-natured when they highly commended it.

The hunter sires were a queerer lot than ever, and till the Society require three crosses of blood at least, the class will never be better. There is no reason why they should not do so, as the stamp of horses which they do not wish to exclude are really those which have only "a few hairs in their tail wrong." Nearly all the most experienced hunting men go for blood at least in the sire, and the welters say that thorough-breds have carried them better than anything else. On the other hand, a very first-class horseman writes us: "I have known several good hunters by half-bred horses. The late Sir Richard Sutton had one of his favourite horses, Martin, by a horse which could trot sixteen miles an hour, and which he used to drive to cover in his four-in-hand, spotted pie-bald team—and out of a thoroughbred racing mare. I have known and ridden several good hunters by cart-horses out of a thoroughbred mare, and they were generally very good jumpers." This is by no means the first time that Leicestershire has borne some such testimony. Here we were not in love with the decision, and we liked both Safeguard and Elcott, with his terribly-capped hock, better than the long-necked and leggy Sir Peter Laurie, who looked far better at Warwick, where he was beaten by a regular "wooden 'oss." There is very little style about Elcott, but if like begets like, we should hope to see a good many Safeguards in the land, although he wants rather more scale. President Junior, who wore a regular collar of decorations, is simply a trotting cob stallion, and he cocked his tail and went like a regular Firaway, the moment he was called on for down the middle, in a way which delighted Mons. de Thannberg, the Master of the Imperial Haras, beyond measure. He seemed in this class to have eyes for nothing else. Weapon was very common; and Bromley, a poor affair in a white bandage; and there was rather a handsome Falcon, with no liberty about him. Solferino stepped out well, but we can't say much more for him; and the grey Brilliant looked for all the world as if he had stepped out of one of those old canvasses by Sartorius, where the family servant, in a souff-coloured livery, invariably holds the rein, and looks notes of admiration at things in general. As for many of the rest, we know not how to describe them—Clevelands, one-half Cleveland half-Norfolk; in short, the class was its own condemnation, under its present rules.

The hunters were below the Emeralds, Adam Bedes, Neck or Nothings, Overpluses, and the grand congregation at Leeds, but still with good sterling stuff amongst them. Beechwood, who seems as fond of prizes as a squirrel is of beechnuts, looked as if he had been indulged with some of

Cuddy's oilcake, or the malt upon which his master has been giving some very valuable testimony to the faithful Commons, and not so well in consequence. The following are his principal appearances: As a two-year-old he was not placed at the Durham County Show at Sedgfield, in the coaching class, where Mr. Booth bought him. He was second in a large field of two-year-old hunters at the Cleveland Show at Middlesbrough; got the second prize in the hunting class at Catterick, and the second ditto at Bedale. As a three-year-old he was second at Ripon (to Batchelor, a horse of Mr. Booth's); second at Darlington; second at the Cleveland Show, at Yarm; first at the Royal, at Leeds; first at Catterick, and second at Bedale. As a four-year-old, he was second at the Yorkshire, at York; first at the Cleveland, at Guisbro', where he beat the York prize horse; first (with silver cup), for hunters of all ages at the Craven Show, at Skipton; first for hunters of any age, for Mr. G. L. Fox's prize, at Wetherby; second for hunters of any age at the Liverpool and Manchester Show, at Warrington; first for four-year-old hunters, at Catterick; second for the hunters' cup, at Bedale; and first at the Royal at Worcester. He also won three or four times as a foal and yearling.

The chesnut Steam Plough was a regular whacker, both by name and nature; and certainly he might carry eighteen stone instead of fifteen. His action shows him to be something more than the stick-fellow which he first seems to be when he looms on you like a second Magog; but he could hardly try his fortune from Cream Gorse to Rolleston-Perfection was a neat little round horse, over-marked with fifteen stone; and Hunting Horn, a deep and shortish silver grey, with not much pretensions beyond a first whip's horse. Topsy was on leg, and Gay Boy a great raking gentleman, of sixteen and a-half, who, they say, can go fast and fence. Charles XIIth's forte was hunters (as John Walker knows) and not racers; and here was the highly-commended Endurance, the fruits of a season's sojourn in Hereford. The other H C was a nice chesnut, by old Hereford from a Steamer mare, and rather higher on the leg, and Harry Ayris, who knows what a hunter should be, with Blood Royal and Micklewood in his mind's eye, was hanging very fondly over him. Elastic was another proof that Teddington has left us a race of heroines, although they did crab him so, and she struck us as being quite worthy of second place. Both she and the winner are above sixteen hands. Mr. Booth has had wonderfully good fortune with his horses, as Beechwood has only carried on what his Jeweller (well named after the bull which founded the Towneley herd) and Vaultier began.

The Highland Laddie, who was sold for 100 gs. at Carlisle, sent a son, Tom Sayers, nearly as handsome as himself, to win the pony sire prize; but he seemed to be too proud of his name, and fought rather too much. Harold, the best three-year-old for hunter or carriage, had lots of quality, but a bad head. The cob of Mr. Branwhite (whose guardian and guide invited eternal attention to a slip in his favour from the papers) rather lacks style in the same quarter, but is pretty clever elsewhere. The second, Tam o' Shanter, was high behind, and no shifting about in his box, up hill or down hill, destroyed the illusion. Lalarge was a fair leader of a poor hunter brood-mare lot; and Crafty, another Cumbrian (like Tom Sayers), and bred by Mr. Dalziel, the coursing judge, a very nice leader of the hackney ditto. The Shorthorn Nestor never tired of looking at her; and when he says "a very clever one," be it calf or horse, the judgment is worth hearing. Among the curiosities were a little flea-bitten grey hunting mare, "Jung Frau," from Worcester; "Blood of Beeswing," a leggy two-year-old, with a long pedigree on paper outside its box; and a "cream with black points" pony Milly, &c.

—*Sporting Magazine.*

REAPING WHEAT BEFORE IT IS FULLY RIPE.

SIR,—In your "Farm Operations for August" I observe you recommend that "wheat should be reaped for six to eight days before the usual time, when it is beyond the milky stage, and has a doughy consistence like fresh bread," and you say the result is a finer sample, more and better flour than from wheat which has become fully ripe, and a larger amount of bread from a given quantity of said flour. About ten years since this theory came first into notice, and I think its authorship is to be ascribed to France, where there had been experiments with wheat in the under and over-ripe stages, the result of which I remember were said to be greatly in favour of the under-ripe. But there does not appear to have been any such experiments instituted at home, and, in the absence of them, I would pronounce the theory to be only a theory still; yet I do not deny the truth of it; notwithstanding, before we overturn the practice of the world in all past time, and enter upon a new system, we should have some proof of the advantages of the latter, lest we might be found seriously astray, and have to retrace our steps after a dear experience.

You have mentioned one most important argument in its favour, "that there is no risk of shedding," and it is agreed that the sample is finer looking. Further than this, however, I am afraid you cannot speak authoritatively, and the remaining assertions are open to question. In England I am told the practice is to cut the grain intended for sale on the early side that they may have a bright sample, but the portion they intend for their own use they allow to ripen fully, as they find it produces a much better and stouter flour, and we all know that a stout flour produces more and better bread. Surely this ancient practice is the result of experience, and the common sense of mankind is not to be lightly set aside.

The importance of the subject is my excuse for troubling you with these remarks, and I hope they will have the effect of eliciting further information in a matter which would be the better of a little more light shed on it.—Yours, &c., D. CARMICHAEL, *Millside Mills, Donaghadee.*

[The above is a very important communication, and to show that we have not given vent to the doctrine of cutting wheat before it is dead ripe without good authority, as well as having had some little self-experience in the matter, we give the following masterly experiments, made in 1840 and 1841 by Mr. Hannam, of North Deighton, in Yorkshire, in his own words:—]

"Having selected a field of old square-headed red wheat for the experiments," says Mr. Hannam, "on August 4, 1840, I cut a sheaf. At this time it was quite green, that is, both straw and ears were in full vigour and full of sap. Though the grain appeared perfectly formed, the chaff still adhered so firmly to it that it was scarcely possible to separate them by friction in the hands. When separated, it was large and plump, but so full of milk that the slightest pressure reduced the whole to a juicy consistency of pulp. This sheaf stood in the field for a fortnight, when it was housed. On the same day, August 18, I cut another. The wheat was, of course, yet 'green,' speaking positively, or 'not ripe,' if we speak negatively, being what farmers commonly term 'raw,' that is, the straw, though appearing at a distance green, when examined closely was of a hue fast approximating to yellow, while for about a foot upwards from the ground it was quite yellow. The ears, too, were more open, the chaff tinged with various shades of yellow and green, and the grain itself, when separated, soft and pulpy, but not near so full of fluid as before. The judgment of the farmer will, however, best tell him the conditions of the wheat both at this and the preceding cutting, when I say that in another fortnight the whole field was ripe. At the end of this fortnight (September 1) I housed the sheaf cut on August 18, and which had remained exposed to the weather in the interval, and cut a third. This I have said was 'ripe,' but by the term I don't mean that degree of ripeness when the straw breaks, the ears curl,

and the grain shakes out, but that condition in which it is customary to commence reaping it—when the straw, from the roots to the ear, is uniformly yellow, and has lost all symptom of vivid health. On the 14th of September the third sheaf was taken from the field and carefully preserved, along with the other two, till the 1st of November, when out of each sheaf I selected 100 ears, and put each parcel into a separate bag. The straw from each of these parcels of ears was preserved carefully. The ears in one bag (No. 1, or that cut very green) were now thrashed, the chaff carefully separated, and the gross weight of the corn yielded ascertained by an extremely accurate balance. The weights of a fixed measure of a certain number of grains were next found: to avoid error, this was repeated several times. No. 2 (cut raw) and No. 3 (ripe) underwent the same process; for the results of which see the following table:—

Comparative Weights of Wheat reaped at different periods.

Time of reaping and condition.	Gross produce.	Equal measure.	Equal number of grains.
No. 1, Aug. 4 (very green)	576	568	19½
No. 2, Aug. 18 (raw)	736	580	23½
No. 3, Sept. 1 (ripe)	660	570	22½

"As this table is merely comparative (the weights used being in parts and decimal parts of the same, for the convenience of minute experiments), it may not be unnecessary to give the following table of the absolute weights of each sample in ounces, drachms, scruples, and grains troy:—

No.	Gross produce.	Equal measures.	Equal number of grains.
	oz. dr. scr. gr.	oz. dr. scr. gr.	oz. dr. scr. gr.
1	4 0 0 0	8 7 1 18	0 1 0 5½
2	5 0 2 13	4 0 0 18	0 1 0 17½
3	4 4 0 6	8 7 2 0	0 1 0 15½

The straw belonging to each sample was now weighed (all the parcels having previously been made of the same length, commencing from the bottom of the ear), when the following was the result:—

Comparative Weights of 100 Straws, of an equal length, belonging to the Samples Nos. 1, 2, 3.

No. 1 (green)	=	560.
No. 2 (raw)	=	475.
No. 3 (ripe)	=	450.

The next thing to be ascertained was the quality of the produce, or the comparative worth of each description. Believing in the old saying, that

"The proper value of a thing
Is just as much as it will bring."

On the 5th of November I attended market, and asked the opinion of an extensive corn-grower as to the values of the respective samples, according to the prices of the day. His opinion was

No. 1.....	61s. per quarter.
No. 2.....	64s. do.
No. 3.....	62s. do.

Putting the same samples into the hands of an extensive corn-factor and miller, his value, and what he would give to buy, was, for

No. 1.....	61s. per quarter.
No. 2.....	63s. do.
No. 3.....	61s. do.

Adding these values respectively together, and taking the mean price of each (by which we shall obtain as near an approximation to the truth as possible), we have

No. 1	=	61s. 0d. per quarter.
No. 2	=	63s. 6d. do.
No. 3	=	61s. 6d. do.

The loss or gain on these samples, by reaping at different periods, will be best seen from the following:—

Table of the Relative Weights and Value of Wheat cut August 4, August 18, and September 1; that cut last (or ripe) being taken as the standard, and unity assumed as its value in each column.

	Weight of gross produce.	Weight of equal measures.	Weight of an equal number of grains.	Value.	Weight of the straw.
Sept. 1 (ripe) 1	1	1	1	1	1
Aug. (raw) .. 1	43-325	1-57	1-2-91	1-4-128	1-1-18
Aug. (green) 1	288-335	284-585	78-91	122-123	1-2-9

According to this table, it is evident that the wheat reaped a fortnight before it was ripe has the advantage of the ripe in every point—

"1st, In weight of gross produce 43-325ths, or 13 1-5th per cent.

"2nd, In weight of equal measures 1-57th, or nearly $\frac{1}{2}$ per cent.

"3rd, In weight of equal number of grains 2-91's, or nearly 2 1-5th per cent.

"4th, In quality and value 4-128rds, or above $\frac{1}{2}$ per cent.

"5th, In weight of straw 1-18th, or above 5 per cent.

"On the other hand, that reaped a month before it was ripe has an advantage of 23 per cent. in weight of straw compared with the ripe, but in every other point has the disadvantage. Thus—

"1st, In weight of gross produce 37-325ths, or 11 5-13ths per cent.

"2nd, In weight of equal measures 1-385ths, or rather more than 1-3rd per cent.

"3rd, In weight and number of grains 12-91's, or better than 1-5th per cent.

"4th, In quality and value 1-128rds, rather more than 4-5ths per cent.

"It may be here necessary to mention that the sample No. 3 (ripe) was very bold, but rather coarse, feeling rough in the hand; while No. 2 (raw) was quite as bold, but very fine and thin in the skin. No. 3 (green) was also a good and clear sample, but much smaller than either of the others. This will account for the apparently anomalous fact of there being scarcely any difference in the marketable value of the green compared with the 'ripe,' while there is a difference of 13 per cent. in favour of the ripe in weight of equal numbers of grains; for the sample being dry and good, the buyer lost little by this inferiority in the size of grain, as the weights of equal measures were the same—the difference of 1-285ths scarcely making $\frac{1}{2}$ lb. in the sack.

"From the above details, it would appear that it is the farmer's interest to cut his wheat before it becomes thoroughly ripe. Many, no doubt, will be disposed to doubt deductions of such importance drawn from such limited experiments. This objection the writer anticipated, because it is a natural one, which he felt himself when he considered the most important conclusions which resulted. When, however, he retraced, step by step, his investigations, without any variation in that result, he could no longer refuse to believe it true till he proved it untrue. He is aware that there are other points of consideration in this subject—that there are peculiarities in the nature of land, of seed, or of season, and that there is, as in all men's investigations, a possibility of error, any of which circumstances might materially affect the result of experiments upon so limited a scale as the present one; and for this reason he gave the subject a trial in the ensuing harvest on a much more comprehensive scale; and not one single operation in that trial, neither reaping, stacking, thrashing, dressing, grinding, nor weighing, was carried on without his immediate superintendence.

"The field of wheat chosen for this experiment was an even average crop, the soil thin limestone, and the seed the old square-headed red—the same experimented upon before. In order to make the experiment more valuable, and to fix more accurately the golden mean between the too green and the too ripe, I had twenty parcels of adjacent furrows reaped at the following period:—

No. 1, reaped August 12th, stacked August 26th.
No. 2, do. August 19th, do. August 31st.
No. 3, do. August 26th, do. September 8th.
No. 4, do. August 30th, do. September 9th.
No. 5, do. September 9th, do. September 16th.

On stacking the various cuttings, I took a sheaf from each parcel, for the purpose of exhibiting a sample of the grain of each at the annual meeting of the Wetherby Agricultural Society, held September 23, 1841. As in my former experiment, the sample of the ripe wheat, No. 5, appeared bold, but coarse; while the green, Nos. 1 and 2, were finer in the skin, but smaller in size. The raw cut, No. 3, however, was unexceptionable as a sample, being equal in boldness and fullness of grain to No. 5, and superior to Nos. 1 and 2 in the thinness and uniform clearness of skin. Scarcely any difference was discoverable between 3 and 4; the latter was, however, rather more rough to the touch than the former. This superiority of the raw cut grain was observed and acknowledged by hundreds of practical agriculturists at the meeting alluded to, and was confirmed by the judges, who awarded to me one of the extra premiums, "with a high commendation of the sample No. 3, reaped a fortnight before the ripe." On February, 1842, the whole of the various cuttings were thrashed and dressed under my own eye, when the following were the results:—

Bushels of wheat.		st. lbs.	st. lbs.
No 1	gave 2 $\frac{1}{2}$ weighing	11 12	and 23 7 of straw.
" 2	" 2 $\frac{1}{2}$ "	11 1	" 21 8 "
" 3	" 3 $\frac{1}{2}$ "	15 10	" 20 8 "
" 4	" 3 11-16 "	16 6	" 19 3 "
" 5	" 3 $\frac{1}{2}$ "	14 18	" 18 0 "

Having in my former trial ascertained the value of the various samples by the opinion of the market, and in this case confirmed it by the public decision of the judges at an agricultural meeting, I determined, in order to leave no loophole for doubt, to test their qualities at the mill, and to see in what, and to what extent, the difference of quality existed. Having, therefore, to prevent mistake, affixed my own seal to the sacks, and placed them under the care of Mr. John Hardcastle, of Hunsigore Mills, near Wetherby, the gross quantity of each variety was ground and dressed, with the following results:—

No.	Gross Quantity.	Weight of Grain.	Weight of Flour.	Pollard or "sharps."	Bran.	Waste.
1	2 $\frac{1}{2}$ Bushels.	st. lbs. 11 12	st. lbs. 8 12	st. lbs. 0 12	st. lbs. 2 1	1
2	2 $\frac{1}{2}$	11 1	8 6	0 11	1 11	1
3	3 $\frac{1}{2}$	15 10	12 6	0 12	2 1	5
4	3 11-16	16 6	12 3	1 3	2 5	9
5	3 $\frac{1}{2}$	14 18	10 11	1 9	2 5	2

"From the foregoing results, then, we deduce the following table of the quantities of flour, seconds, and bran, per bushel, from each parcel:—

No.	Flour.	Pollard.	Bran.	Weight per Bushel.
1	lbs. 45 1-11	lbs. 4 4-11	lbs. 10 6-11	60
2	47 1-5	4 2-5	10	63
3	49 5-7	3 3-7	8 2-7	62 6-7
4	46 22-59	4 35-69	8 56-59	62 22-59
5	43 1-7	6 4-7	9 3-7	59 5-7

"The same data furnish us with the quantities per cent. of flour, pollard, and bran yielded by each parcel: thus, 103 lbs. of grain without waste—

No. 1 gives	Flour.	Pollard.	Bran.
	lbs.	lbs.	lbs.
1	75 5-33	7 9-33	17 19-33
2	76 48-77	7 11-77	16 18-77
3	80 40-43	5 26-43	13 21-43
4	77 83-221	7 153-221	14 206-221
5	72 198-207	11 23-207	15 193-207

From this it appears that had not the very green failed in quantity, it is superior to the ripe in quality—making

more flour by 2 per cent.; while the raw, No. 3, is superior to all the other varieties. Thus, the bushel of No. 3 gives more flour than the bushel of No. 5 by 6 4-7th lbs., showing a gain of 15 1-7th per cent. in weight of flour upon equal measures of grain. We also find that 100 lbs. of wheat, No. 3, make 80 40-48 lbs. of flour, while 100 lbs. of No. 5 yields 72 196-207 lbs.—showing an advantage of 7.984, or nearly 8 per cent. in favour of No. 3 upon equal weights of wheat. To those who are acquainted with Mr. Hardcastle, it will be unnecessary to say that neither ignorance nor design produced these results; and, when I state that he devoted his attention for several hours, and a portion of his machinery, to the exclusive trial of these wheats, it will be of little use to add (though such was the fact) that every operation was conducted under my own eye, and that each parcel underwent an exactly similar process. Indeed, I must say that Mr. H. entered into the investigation with a spirit fully equal to my own, and conducted it with a skill that left me nothing to do but to thank him. And, surprising as the results of this investigation may appear (surprising as they appeared to me) I must give Mr. Hardcastle credit for anticipating them in some degree; for, before the operation of grinding was concluded, he expressed to me his pleasure at being chosen to carry out an experiment of such interest; 'as a mark of which interest,' added he, 'I have no hesitation in saying (and my opinion is confirmed by the senses of a practical miller—the sight, hearing, and touch) that No. 5 (the ripest wheat) grinds the worst—worse even than the greenest; a fact which few would believe unless they saw.' The results, as we have seen, fully confirmed Mr. H.'s opinion; and further examination explained the whole matter. In No. 5 we found a much greater quantity of flinty particles, which would not pass through the flour sieve, than in any other—a fact which clearly explained why it should, in miller's parlance, 'grind worst.' The deficiency of No. 5 in yield of flour, when compared with No. 3, was accounted for by the difference in the quantity of the pollard (or sharps), and in the quality of the brans, the bran from No. 5 being coarse and heavy, while that from No. 3 was thin as a bee's wing. 'Should a practical miller examine these brans, and be informed that they were from the one sort of wheat,' remarked Mr. Hardcastle at the time, he would call No. 5 a very common specimen of grinding, and censure the miller; the other he would term a beautiful piece of workmanship, and say that the man who ground it knew how to prepare his machinery; yet the fact is, one miller and one mill have ground and dressed both.' The flour from the various wheats Mr. Hardcastle declared to be worth, at that time, 2s. 6d. per stone, wholesale. The pollard he valued at 1s. 8d., and the bran at 10d. per stone. Taking the straw at 2d. per stone, the real value of the respective outtings will stand thus:

No. 1.		
8st. 12lbs. of flour, at 2s. 6d. per stone	£1 2 1½	
12lbs. of pollard, at 1s. 3d.	0 1 0½	
2st. 1lb. of bran, at 10d.	0 1 8½	
22½st. of straw, at 2d.	0 8 9	

Total value of the produce of 20 perches £1 8 7½

No. 2.		
8st. 6lbs. of flour, at 2s. 6d. per stone	£1 1 0½	
11lbs. of pollard, at 1s. 3d.	0 0 11½	
1st. 11lbs. of bran, at 10d.	0 1 5½	
21st 3lbs. of straw, at 2d.	0 3 6½	

Total £1 7 0½

No. 3.		
12st. 6lbs. of flour, at 2s. 6d. per stone	£1 11 0½	
12lbs. of pollard, at 1s. 3d.	0 1 0½	
2st. 1lb. of bran, at 10d.	0 8 1½	
20st. 8lbs. of straw, at 2d.	0 8 5	

Total £1 17 3

No. 4.		
12st. 3lbs. of flour, at 2s. 6d. per stone	£1 10 6½	
1st. 3lbs. of pollard, at 1s. 3d.	0 1 6	
2st. 5lbs. of bran, at 10d.	0 1 11½	
19st. 2lbs. of straw, at 2d.	0 8 2½	

Total £1 17 3

No. 5.		
10st. 11lbs. of flour, at 2s. 6d. per stone	£1 6 11½	
1st. 9lbs. of pollard, at 1s. 3d.	0 2 0½	
2st. 5lbs. of bran, at 10d.	0 1 11½	
18st. of straw, at 2d.	0 3 0	

Total £1 13 11½

Giving for the value of an acre of		
No. 1.—Cut a month before fully ripe	£11 9 2	
No. 2.—Cut three weeks "	10 18 4	
No. 3.—Cut a fortnight "	14 18 0	
No. 4.—Cut ten days "	14 17 0	
No. 5.—Cut ripe "	13 11 8 "	

[In the milling districts in the south of Ireland both millers and farmers are well aware of the value of reaping wheat some days before it is dead ripe, and have done so for the past 30 years; so well was the necessity of reaping millers' samples early and those for seed at a mature state, that some years since, and for several years, the Royal Dublin Society gave two prizes of equal value, for white and red wheat—one for the best millers' sample, and the other for the best seed sample; for the seed should be allowed to stand much longer unthreshed than the grain for the miller's use; but we must acknowledge that the matter is much easier managed in the south and midland counties than it is in some places in the north, where the climate, though the land may be deep and fertile, is more damp and humid than in the drier portions of the island.]—*Irish Farmers' Gazette*.

THE CORN FIELD.

Swaying to and fro, With a wave-like motion, When the glad winds go Dancing o'er the ocean; So the bending grain, While the breeze is blowing Imitates the main, Rising, falling, flowing. O, the goodly scene, Fair and rich and mellow, All of late so green, Chang'd to golden yellow; Chang'd to yellow gold— No, for gold is specious; Better thousand-fold, Into food more precious. Erewhile all was grass, Simply grass so seeming, Then we saw it pass Into stalks ear-teeming; So it grew and grew, Fuller, riper daily, Grateful to the view, Flourishing most gaily. Like some maiden fair, Deck'd to meet her lover, And whose auburn hair Silver tresses cover, Even so the corn, Graceful, tall, and airy, Blossoms bright adorn, Fitting sylph or fairy. Smiling in the sun, Playing with the shadows, As the light clouds run Over fields and meadows; All the live-long day Rustling, waving, sporting, And at evening gray Drinking dew and courting Courting sleep and rest, Finding peace and quiet, Save when some unblest Wandering son of riot, Some wild vagrant wind, Needful alumber scornings, Like a graceless hind, Keeps awake till morning,	From a little seed Laid Earth's bosom under, Growing like a weed, Came this queasily wonder; On it shone the sun, On it fell the showers, Till its vigour won Life-sustaining powers. Wondrous in its birth, Wondrous in its being, Hid below the earth, None the process seeing, One became a score, Yes, ten score or twenty. Heaven thus evermore Fills the lap of Plenty. O, the blessed sight, O, the prospect charming, With unfeign'd delight Every bosom warning; For this self-same wheat, In a season suited, Shall both good and sweet Be to bread transmuted. Bread to nourish life, Bread to strengthen labour, When the crooked knife, Peace's only sabre, By the reaper's hand Used in harvest weather, When the maiden band Bind the sheaves together. Then the clacking mill Shall to dust reduce it, And the baker's skill In his service use it; Then shall blessed bread, Plac'd by housewife able, Beat of wheaten red Stand upon the table. Glory be to God, Let us all be giving, Who from out the sod Feeds His creatures living; And let pray'r be said, Pray'r that knows no masking, "Give us daily bread," To have the same for aking.
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THE PUBLIC JUDGE.

Public judging may now be considered the order of the day. No doubt that the system has its drawbacks; but the world having once been admitted will never again be inclined to forego its privilege. The aim, then, must be to make the practice as perfect as possible; and in a few years' time perhaps the Stewards of the Royal will instruct their Director to organize some really intelligible method of announcing the awards as soon as they are agreed to. Or, again, such terribly unimpressible people as the managers of the Highland and Northamptonshire Societies may come to see that the issue of a catalogue need not lead to any actual dishonesty; and that a long, lathy cowman lounging into the ring, class after class, may "let out" a deal more than the most elaborate entry that ever was printed. If a gentleman in office sought to deserve well of his country, he would order these finger-post attendants to change about occasionally, and lead on any other animal but their own. Let "Toddy" take in a new man's heifer, while some stray waif of a lad be put for the nonce in charge of the highest bred Booth or Bates to be found in the Herd Book. But the principle of the thing must not stop here. At Worcester the other day, after a deal of toil and trouble, men like Mr. H. B. Caldwell, Mr. Sewell Read, Mr. Owen of Rotherham, and Mr. Jacob Wilson, arrived at certain opinions as to the quality of the work specially effected under the process of cultivating the land by steam power. From the commencement of the trials to the declaration of their decisions, they were, as they even still are, before the public; and Messrs. Howard, of Bedford, and Mr. Smith, of Woolston, when they refuse their prizes know as well to whom the slight is intended to apply as if they had addressed their letters to individuals instead of to the Council of the Society. Still, as the Howards refuse a third prize, and Smith immediately trumps their card by declining a second, the argument scarcely amounts to more than a plea for the establishment of some such agreeable system as everybody taking nothing less than the first place on the list. However, the Judge in these days has certainly his full liability, and as, so far, there can be but few winners to many losers, the appointment is not altogether an enviable one, the more especially if the exercise of any bad taste should allow the chagrin of defeat to express itself in pointed abuse. One exhibitor takes the first prize, and straightway the winners of secondary honours indulge in the art of polite letter-writing; or, if less particular, in the use of strong language.

But, unfortunately, or unfairly at any rate, the Judges of the Royal Agricultural Society are not all equally liable. If you set up as an authority on shorthorns, Herefords, horses, sheep, pigs, ploughs, or thrashing-machines there will be crowds of exhibitors ready to discuss your decisions, although they may not proceed to the extremity of returning premiums, which the very entry should warrant their accepting. An Englishman virtually agrees to abide by the rules and conditions of the occasion when he enters into any public competition whatever; and if he has a complaint to make, does not go to appoint himself as the arbitrator, but becomingly prefers his objection in the proper quarter. We have seen an ignorant herdsman are now throw away his commendation card when he had made up his mind that he was going to have the best prize; but the fellow's imprudence only served to raise a laugh at his own expense, and in the end

probably did him and his master, if anything, more harm than good. But there are, we repeat, peculiar provinces in the business of the Royal Agricultural Society, where the Judges act with the utmost impunity. Like the hero of the fairy tale, they put on their invisible cap, and then do just whatever they like with us.

At that same Worcester meeting prizes were offered for the best application of steam-power; but long previous to these trials a prize had been also announced by the Society for the best Essay on the Results of Steam Cultivation. We believe that the award has been duly made, or at any rate some of the rejected addresses are already in circulation. Probably the authors of some of these efforts may consider their own bantlings quite as good as that preferred by the judges. But then, who were the judges? Messrs. Howard and Smith would make it appear by their graceful refusal of the Society's recognition, that the judges of steam ploughing were incompetent; and Messrs. Marsh Read, and Simon Hutchinson may say as much of the judges of the Essays on Steam-ploughing. But little do these literary Solons care, for they walk in the dark, and, for all the world knows to the contrary, the editor alone of the *Journal* may have to distinguish between the different degrees of merit! But why should it be so? If there is anything in the principle of open responsibility, why should not a judge of essays be as answerable to criticism as a judge of stock or implements? We do not argue that the names of the adjudicators should be announced previously, but that their signatures should be appended to the prize essay, just as the other judges sign their awards in the Secretary's office. We are quite sure that such a plan would give writers more confidence, and be likely to lead to far more competition than the present hole-and-corner method, where the Editor is said to be walking about with a bundle of Essays in his pocket, and asking somebody to help him to read them! The course we so strongly recommend is, moreover, not without precedent. In the last number of the Bath and West of England Journal—a work very ably conducted—there appears an admirable article by Dr. Crisp on the Lamb Disease, with this note attached to the title of the paper: "To this Essay the prize of thirty pounds was awarded by Lord Portman, the chosen adjudicator." Here is authority at once for all that was done, and as Lord Portman is also a member of the Council of the Royal Agricultural Society, we do hope to see the good example he has set followed by his fellows in Hanover Square. The simple fact is, that the Agricultural Society of England cannot speak with too much or too tangible an authority. Let it be known that the names of those who do compare the different Essays will be given with the decision. Only last year a most ill-advised step was adopted, in withholding the names of the judges who reported on their several sections of the stock department; their remarks and deductions as a consequence not carrying half the weight with them they otherwise might have had. It really sounds only like fair-play, that a man may have the opportunity of answering for all he has done; and we think well enough of our judges, be they appointed for stock, machinery, or essay-writing, to believe that they themselves would have no objection to put their mark to their own handiwork.

We have been led into these important considerations by the appearance of two of the rejected essays on the results

of steam cultivation. The one by Mr. Marsh Read, of Elkstone, Cheltenham, has been "commended" by the judges; but the other by Mr. Simon Hutchinson, of Manthorpe Lodge, Grantham, has not been deemed worthy of any such a compliment. Still the latter, bearing the somewhat ominous title of "FIRE AND WATER," reads like just the sort of article the Society was asking for, in the way of actual "experience and observation;" whereas Mr. Read's

commended essay combines a deal of the information of others—well put together, but at the same time tolerably familiar to those who have studied the subject. It is not our purpose here to anticipate any comparison of the Society's prize paper with these opposing productions, but we must still press a question that is sure to be asked over and over again, "Who were the judges?"

THE KENT CATTLE AND IMPLEMENT SHOW AT MAIDSTONE.

During the last two or three years a strong effort has been made by the men of Kent to unite their own county with Surrey and Sussex in one agricultural association, which shall take within its range these three divisional districts. The chief bar so far to any so desirable an association has been on the part of Sussex, which, though unable to maintain such an institution of its own, still hesitates to join with its neighbours. However, for all the great purposes of liberty, equality, and fraternity, the Kent show is even now sufficiently cosmopolitan, and with only some assistance from other quarters there are clearly the elements of a very successful meeting. Noticeably enough, moreover, although Sussex cannot afford to bodily join in the movement, some of her leading agriculturists figure in the Maidstone catalogue as exhibitors, and certainly with every encouragement for crossing the boundary line. Many of the best beasts and sheep were from these parts, and the most prominent prize-takers were a well-known firm of brothers from Arundel, of the merits of whose stock the public is pretty generally becoming cognizant. If the exhibition had a speciality, it was the entry of Sussex cattle, which were numerically in force, and yet more commendable for individual examples of improvement. The Messrs. Heasman, one of whom is an Editor of *The Sussex Herd Book*, have done much in this way, and their prize cows and heifers, many of them already distinguished at the Royal, are very admirable for size, symmetry, and quality. In fact, this kind of stock, whether from Kent or Sussex, evinced some very satisfactory advancement. The beasts are gradually losing much of the mere coarseness of the yoke, and becoming proportionately of more value to the butcher. The females, more particularly, have, where carefully cultivated, a handsome blood-like appearance, that amply demonstrates the good reason for going on with them; and the register here again of authenticated pedigree cannot be without its effect. The bulls were, at any rate in the old class, not so promising, and Messrs. Reeves' cup winner, as the best Sussex bull in the show, is a plain animal with very coarse, bad shoulders, and otherwise deficient, though with a certain length of quarter, a point for which the breed, so far, have not been very noticeable. The second best was a short, lumpy, over-fed beast, bad behind, but small in the bone, and with a neat Devon head, though said to be pure Sussex bred. A good big useful bull of Mr. Durrant's was highly and deservedly commended, but Messrs. Heasman's first Battersea yearling was passed over, having been in strong work since then, and showing narrow and picked. Their younger bull here was in much better form, and, level, lengthy, and stylish, the award of the cup against him was open to continual discussion. The other successful exhibitors of Sussex cattle, beyond those we have named, were Mr. Tilden Smith, who took a second premium with a very fine, sweet cow, and Mr. Jenner, of Udimore, who was second with a heifer, and first for a bull calf. Beyond these, there were numerous commendations, shared amongst Messrs. Botting, Buss,

Berger, and those who also reaped some more substantial reward.

Commendations certainly cost nothing, and we never remember gentlemen more liberal in this way than the judges at Maidstone. Amongst the Shorthorns, particularly, they appear to have complimented everything that was a Shorthorn, on this agreeable fact; and in another rough lot of old bulls, if any animal was not commended, it was either from his having taken a prize, or being highly commended. Messrs. Swaisland and Stable, of Crayford, who bought the chief lots at Sir John Lubbock's sale, carried away the £10 for the best bull, with a long just serviceable animal, but with a bad flabby touch, and Mr. Betts the second premium of £7, with a better handler; whilst the placing of the first and second cows, both also from the Preston Hall herd, created a very visible difference of opinion between the judges and the more general public. The old cow, *Lady Ruby*, is not so true through as the other, but she has a better head, a broader back, and a finer quality; and this no doubt settled it, or as one dissenter put it, "no doubt they judged them with their eyes shut." The heifers under two years old, the first exhibited by Swaisland and Stable, and the second by Mr. Betts, were both very good, and for breed and substance about the best pair of shorthorns in the show. These two herds stood precisely in the same positions amongst the older heifers; and Mr. Morland claimed the best yearling bull, a very well bred one; with Lord Darnley the first for bull calves, in a plain leggy badly-coloured animal, whose excellence surpasseth show. Mr. Betts had one of some months older, of nice quality, and wonderfully well grown, but with his horn going wrong, a drawback which probably told against his reaching beyond a high commendation, or otherwise he looked like the best of his class. Other such supplementary distinction went broadcast to Mr. Pack, Mr. Roper, jun., Mr. Wells, Mr. Hales, and Mr. Troughton; Mr. Betts receiving five commendations, in addition to his five premiums, in the six classes. A lot of cows of other breeds, neither Shorthorns nor Sussex, were passed over, as possessing no merit; but an immense beast, exhibited by Mr. Terrington, of Staplehurst, was declared good enough to take the prize in the companion class, and for upstanding height and size was quite a show in himself.

A man may see Shorthorns and Southdowns anywhere, but still one of the great treats of the day was the brothers Heasman's beautiful pen of ewes, the same five that won at Worcester, and now looking more perfect than ever. But then the comparison with the Kents, or even the other Downs, was so striking, that the excellences of the one and the defects of the other came out stronger than ever they would have done had the Royal pen been away. Certainly the pure Kent sheep, the aboriginal of the ark as it were, is a marvellous animal in these times, with his long thin neck, his razor back, his narrow frame, and flat sides. But, then, they generally show him just as he comes off Romney Marsh, where, after being starved

in his youth, he is left to shift for himself, without an ounce of corn or cake to help him on to the shambles. And, moreover, experience goes to say that no other sort would do so well on the same terms; while, as for the customer, the most fastidious of West-end butchers will tell you that, after the Southdown of course, there is no other sheep that dies better. His flesh is sweet meaty mutton, not blubber; and his thick close curly coat, again, as good a fleece as one need to handle. But still, for all this and that, he is a terrible scarecrow on the show-ground; and it is not until Mr. Murton of Smeeth takes hold of him, and feeds him, and trims him, and otherwise cultivates his best points, that the Kentish sheep gets breadth and width, and really turns out a square, compact, creditable animal after all. Of course the Cup for the best Kent went to the Smeeth flock, which won, as at the great Canterbury Show, with rams and ewes, just wherever they competed. Amongst the more genuine curiosities, Mr. H. Rigden, of Lyminge, obtained the preference; but it must have been a sore trial to his namesake from Hove to commit himself to the encouragement of such a pure breed as he here honoured with his official approval. Mr. Read, of Elkstone, won all the first prizes for Other Long-wools with some native Cotswolds; and the Messrs. Russell, for the Other Short-wools, entered some good, useful West Country Downs, but there was no competition; while Mr. Betts' prize pen of cross-bred ewes were really marvellous in their way. Every one of the five had a distinctive character of her own: one a white face, another a dark face, and so on, with as much variety in other points; and it would certainly be instructive to know how they were bred. Messrs. Heasman's Southdown rams were as immeasurably superior to their competitors as the ewes; but Lord Darnley, in the absence of the Angmering flock, won the premium for the older ewes with a creditable pen, bred by Mr. Gorringe, of Kingston.

Kent is not very famous for draught horses, but there were unquestionably some very wonderful animals here, if we are only to credit all the catalogue says on their behalf. Here, for instance, is the simple entry of the stallion that took the second prize:—"Mr. Wm. Sumner, Park Corner, Groombridge, 'Farmers' Glory,' 8 yrs., bred by Mr. Thos. Leeder, of Upwell, Cambridgehire. 'Farmers' Glory' stands 16 hands 3 inches high, 8 years old, colour a rich bay, with remarkably short black legs, and extraordinary large bone; was bred by Mr. Thomas Leeder, of Upwell, Cambridgehire, and is allowed by competent judges to be one of the best cart horses in the county. His sire, that splendid colt, Farmers' Glory, the property of Mr. John Morton, of Wellney, Norfolk; which colt sold for 200 pounds to go abroad, which horse was by Farmers' Glory, a well-known horse in Lincolnshire, which sire stands highest for valuable horses of any in the country. Farmers' Glory's dam, a bay mare, which was allowed by competent judges to be the best cart mare on Twenty Thousand acres of Upwell; her sire is that of the noted breed of Mr. Jones, of Flood Ferry, Cambridgehire. The sire of this horse cannot be traced to a greasy, farcy, or blind one. This horse was successful in taking the prizes at Rye and Groombridge Agricultural Shows in 1861." We defy all Yorkshire to beat such a description as this; upon which it is only necessary to say further, that Farmers' Glory has no action, and that Mr. Wells' Suffolk, though only commended, was altogether a more clever animal, the point of preference resting between him and the first prize stallion, a white-legged Shire horse that could move, and that looked all over just the sort for the district. There was, perhaps, no getting away from such a walker, but surely the cheemut should have followed him. The pride, however, of the horse-show centred over Mr. Walker's two mares, and his three-year-old filly—all three very hand-

some samples of the Suffolk, and as a lot had to beat anywhere. The two mares, indeed, matched well with the Angmering pen of Southdowns as the very plums of the whole show, both being backed with foals by the Hero, and one of these a wonderfully well-grown colt, with big limbs and joints, but standing a little high from the hock to the ground. Mr. Walker hails from Wennington, in Essex, and his filly, bred by Mr. Ward, of East Mersea, has had many a good word from us before to-day. The commendations were as thick as blackberries here again, and Mr. Pack's Young England's Glory, with a character as long as a sermon, was highly approved, while Mr. E. Knight, Mr. Simmons, and Mr. Wells, were simply commended. In the class of two-year-old fillies Mr. Walker made no entry; so Mr. Wells won with a Suffolk, and Mr. Ward of Farleigh, in the absence of any further competition, received the five for second.

The premiums for whites, blacks, or Berkahire pigs were divided amongst Messrs. Betts, Leney, and Hales, with no end of commendations, which we come to regard at last as a mere matter of course, and as signifying little more than a desire to make every thing as pleasant as possible for everybody. Unfortunately the rain rather interfered with this kindly intention, and put a stop to the steam cultivation, where, on the previous day, the Howards had been doing some capital work with their three-furrow plough; but the implement was in the hands of a customer, and not for competition. A special premium, however, was awarded to Wood, of Thames-street, for his one-horse reaper with a ribbed platform, which acts as a clearing brush, and that, as we hear, also won many friends from its performance on the opening day, though the elements prevented any further illustration of its merits when the multitude should have, and under more favourable circumstances would have probably noted the efficiency, of a cheap simple implement that is pretty certain to sell in this part of the country. Amongst the home manufacturers the Messrs. Weeks made up a very creditable stand, and the awards were thus distributed:—

Premium for the best machines for the preparation of corn for market, or of food for stock—Weeks and Son, Maidstone.

Premium for the best machines adapted for use by hand power—Weeks and Son.

Premium for the best out-door implements for use on the farm—Weeks and Son.

Premium for the best collection of hand tools—W. Dray, Farningham.

Premium for the best collection of articles for dairy and domestic uses—W. Johnston, Oxford-street, London.

Special prize of £2—T. R. and R. Hunt, Earl's Colne, for oilcake breaker.

Special prize of £5—W. A. Wood, Upper Thames-street, London, for a one-horse drop-platform reaper.

Special prize of £1—Messrs. Tindall, Preston, Faversham, for a cliver separator.

HIGHLY COMMENDED.

H. Bridges, Oxford-street, London, for collection of dairy utensils.

Weeks and Son, for machine for hulling clover.

Weeks and Son, for a four-horse thrashing machine and engine.

Coleman, Chelmsford, for cultivator.

Priest and Woolnough, Kingston-on-Thames, for drill and horsehoes.

W. Ball, Rothwell, Kettering, for cart adapted to farming purposes.

COMMENDED.

C. Sallows, Maidstone, for patent improved brush drill.

The judges were, for horses and cattle—Mr. Geo. Hammond, Horamonden; Mr. Jno. Henry Downes, Grove

Lodge, Fulham, and Mr. Finlay-Dun, Weston Park, Shipston-on-Stour. For sheep and pigs—Mr. Isaac Wildash, Davington, and Mr. W. Rigden, Hove, Brighton. For implements—Mr. F. Beard, Horton Chapel, Canterbury, and Mr. Finlay-Dun.

The proceedings naturally terminated with a dinner, where the more keen of the company were glad to take shelter from the pitiless rain. A Kent agricultural dinner, however, is almost as aboriginal an affair as a Kent sheep, and where the great effort seems to be to prevent the agriculturist from saying anything for himself. Lord Harris performed the duties of the chair with good taste and efficiency, and then everything else was left to the top table. They were not even satisfied with having the same noble lord or honourable member up once and have

done with him, but Lord Sydney having made a speech for himself, was called on again to propose the health of somebody else—as was Sir Brook Brydges, as was Sir Edward Dering and so forth. They would not even allow the winners of the cups to say a word to their brother-breeders, but just for the last toast of the list Mr. Punnett's name was suffered to creep in; though our train was due long before, and we were compelled to run away, from what was no doubt a word or two in good season. As a whole, however, we never witnessed a more dull or dreary entertainment, and if there is to be any amalgamation, one of the first reforms must be in the arrangements of the toast list. Such an inundation of noble lords and commonplace compliments must eventually dampen the spirit of even a Kentish fire.

SALE OF THE LAST OF MR. SANDAY'S FLOCK OF LEICESTERS.

The remaining portion of the flock of pure Leicesters, the property of Mr. William Sanday, Holme Pierrepont, Nottingham, was disposed of by Mr. H. Strafford, on Tuesday, Aug. 18. The lots offered for sale, including sixty-four shearing rams and eighty-eight shearing ewes, were sold without reserve. Previous to proceeding to the paddock, a capital luncheon was partaken of in the Pavilion; but the company was considerably less than has assembled at former sales. The chair was taken by Mr. Torr, of Aylesby, Brigg, who, after proposing the usual loyal toasts, gave the health of Mr. Sanday, whom he applauded for the service he had rendered the community by preserving the pure breed of Leicesters, of which Holme Pierrepont was the classic ground. Mr. Sanday, in his reply, stated that whatever the sheep fetched at the sale he should be perfectly satisfied, and that all would be offered without reserve. Mr. Turner, of Beacon Downs, Exeter, then proposed the health of Mrs. Sanday. Mr. Milward, of Thurgarton Priory, gave the health of the Chairman, to which Mr. Torr replied in genial terms. In the course of his remarks, he said: "A meeting under these circumstances, when we are not likely to assemble on a similar occasion in the same place again, brings with it a shade of sorrow; and I cannot refrain from calling to mind the many pleasant days I have spent here. I believe that on such occasions as this, friendships are formed which would never be made otherwise. I have spent many pleasant days here; and, to my mind, there are few things more jolly—and I have seen many jolly things—than an English ram show (laughter and cheers), where not only present circumstances are looked to, but the future is most pleasantly anticipated. I may now say that, as far as the breed of Leicesters is concerned, I have always been of the opinion that while some persons in the country may cross and re-cross to their heart's content, there is honour due to those who keep the breed of Leicesters pure; and the more that people cross-breed, the more will the pure blood be thought of (Hear, hear). Pinning my faith on that, I shall hold to purity so long as I breed sheep and shorthorns. It is not necessary that every man should be a breeder of pure animals. The world is wide enough for all. If some think that crossing is good, let them cross; but still there will be somebody that will not do it. If it were not for that, Bakewell would have been a fool, and Collins a still bigger one (Hear, hear). After this meeting, if any of you will partake of the hospitality of Aylesby Manor, I beg to invite you to come there; but let not that invitation for a moment supplant your present good intentions."

After the health of Mr. Strafford, the auctioneer, had been given and acknowledged, the company proceeded to the home paddock, and the sale was proceeded with. The shearing rams were first put up. No. 1, by a Battersea gold medal ram, which sold for 140 guineas, was knocked down to Mr. Garde, county Cork, for 30 guineas. No. 2 was purchased by Mr. J. Hall, Scarborough, for the same figure. No. 3, a ram of the Buckley blood fell to Mr. Bid-
dell, of Warwickshire, at 18 guineas. There was a sharp

contest for No. 4. This was a fine animal, by the first prize aged sheep at Canterbury; dam by a sheep highly commended at Carlisle, and first prize at Nottingham. Mr. Dixon seemed very desirous to obtain possession of the ram for Yorkshire, but he was ultimately knocked down to Mr. Cresswell, Ashby-de-la-Zouch, at 62 guineas. A handsome sheep by the second prize at Worcester, dam by the prize ewe at Canterbury, was bought by Mr. George Turner, of Beacon Downs, Devonshire, at 41 guineas. Mr. R. O'Dogherty, of St. Germans, Cornwall, bought a son of the silver medal at Worcester, dam by a Carlisle prize winner, at 26 guineas. Mr. Hall, Scarborough, bore away a promising looking son of the Battersea gold medal sheep, at 40 guineas. And Mr. Torr paid 32 guineas for a well looking descendant of prize winners at Carlisle and Windsor. Amongst the other purchasers were Mr. Dixon, Brands Burton, Mr. Langdale, Lockerville Park, Beverley, Mr. Gould, Exeter, Mr. Henry Waters, Chishill Hall, Royston, Mr. Hewitt, Dodford, Mr. Beale, Lincoln, Mr. Nicholl, Packington, Mr. W. Morris, Cotgrave, Mr. T. Morris, Uleby, Lincolnshire, Mr. Dexter, Warwickshire, Mr. Smart, Northampton, Mr. W. F. Parr, Nottingham, Mr. J. Mann, Spaldwick, Huntingdonshire, and Mr. John Lowe, Gamston, Notts. The 64 rams realized £794 17s., being an average of £12 8s. 6d. each.

The ewes were shown in seventeen pens of five each, and a short pen containing three. The third pen was the principal, as it comprised the same animals that had taken the second prize at Worcester. After a brisk bidding this lot was knocked down to Mr. Hall, of Scarborough, at 55 guineas. Lot 4, highly commended at the same show, was bought by Mr. Turner, of Beacon Downs, Exeter, at 40 guineas. The other purchasers of ewes were Mr. Torr, of Aylesby (who, it was understood, bought for Mr. Riell, of Bray, County Wicklow), Mr. Cresswell, of Ashby-de-la-Zouch, Mr. Darrell, Mr. Morris, Cotgrave, Notts, Mr. Stamper, Oswaldkirk, Mr. Waters, Rev. Mr. O'Grady, vicar of Hogoneston, Ashbourne, Mr. T. Pinder, Barrowby, Mr. Mann, Warwickshire, Mr. Nicholl, Packington, and Mr. Thorold. The ewes realized £462 10s. 6d.

The following is a summary of this and the two preceding sales at Holme Pierrepont:—

	£	s.	d.	£	s.	d.
July 9th, 1862—72 rams ..	1905	15	0			
Average, £26 9s. 4½d.						
Sept. 10th, 1862—37 rams ..	688	16	0			
Average, £18 12s. 4d.						
August 19th, 1863—64 rams ..	794	17	0			
Average, £12 8s. 6d.						
173 rams, averaged £19 12s. ..				3369	8	0
Sept. 10th, 1862—245 ewes ..	1526	14	0			
Average, £6 4s. 8d.						
August 19th, 1863—88 ewes ..	462	10	6			
Average, £5 6s.						
333 ewes averaged £6 ..				1969	4	6
Total, 506 sheep, averaged £10 12s. 6d. ..				£5378	12	6

IMPORTANT GAME CASE.

At the Shropshire Assizes the following case was tried:—

HENRY FURBER v. JOHN ARTHUR LLOYD.

A special jury case. Mr. Sergeant Pigott, with Mr. Mottram, instructed by Mr. Crowther Smith, of Wolverhampton, for plaintiff; Mr. Huddleston, with Mr. Gray, instructed by Messrs. Longueville, Williams, and Jones, of Oswestry, for defendant. Mr. Mottram opened the pleadings, and the case was stated by Mr. Sergeant Pigott.

The action was brought to recover damages for injuries done to certain crops on Leaton-hall farm, occupied by plaintiff, through the preservation of game and rabbits by defendant; contrary, as it was alleged, to the terms of an agreement by Mr. Lloyd's agent when letting the farm (Mr. Lloyd's property) to plaintiff.

Mr. FURBER, being sworn, said: I am plaintiff in this action. In the month of November, 1860, I applied to Mr. Hickman about a farm. I received a letter in reply, and went to him, and he pointed out the Leaton-hall farm. About November, 1860, I and my father looked over the farm, and afterwards went to Mr. Hickman's to lunch. We saw the farm subsequently, and then dined with Mr. Hickman. We went into the office after dinner, and Mr. Hickman asked me if the farm would suit me. I said I thought it would, but that a former tenant had told me that much damage had been done by game and rabbits. He answered that Mr. Lloyd had stated that he might assure any intending tenant that no damage should be done in future. On that promise I agreed to take the farm at 25s. per acre; and I was to provide a bondsman. I gave one, and took the farm. I received a letter, dated the 18th of December, from Mr. Hickman. [The letter was handed in, and was read. It was merely a ratification of the taking.] In March, 1861, I took possession; and in the beginning of that year did not sustain much damage. The farm consisted of 262 acres. In the month of September, 1861, I sowed some vetches. They were entirely eaten off by the game. The following rent-day I complained to Mr. Hickman that the vetches had been eaten off, and that I should be obliged to plough them up. He answered that I had better try them a little longer to see if they would come round. I did try them; but they did not come round. In February I found the wheat being badly eaten off; and I went to Mr. Hickman. I told him that if Mr. Lloyd would give me a memorandum about the game damage and £200 worth of bone manure, I would be bound to lay out £60 per year in manure each year, excepting the last year I held it. He said he would submit it to Mr. Lloyd. I subsequently saw him (Mr. Hickman), and he said Mr. Lloyd would give me £50 worth of bone manure, and that he should expect me to lay out £60 a year in manure. I then asked about the game damage, and was answered that Mr. Lloyd would not be tied to anything of the sort. The hares and rabbits ate the quick between a hedge dividing a field of defendant's and one occupied by me, and a man was sent to put a preparation on the hedge. I said if Mr. Lloyd would not be tied to any damage, I should lose all confidence in the farm. In the month of March I ploughed up the vetches and planted potatoes. The wheat was being much damaged. In the month of March Mr. Hickman produced an agreement, which I refused to sign, as there was no mention therein as to game and rabbit damages; and moreover said I would not sign it except in the presence of my father. A few days afterwards I saw him (Mr. H.) again. He wished to know if I would sign the agreement or not. I told him I would if Mr. Lloyd would give me a counter-agreement to protect me from the game and rabbit damages. He replied that Mr. Lloyd would not be so tied; and I refused to sign it. I sent a letter to Mr. Hickman on May 21st, stating that I was determined to persist in the course I had taken; but that I was not unwilling to be at a reasonable loss by the game. I received no answer. On the 5th July I wrote a letter to Mr. Hickman, alleging that I intended to claim compensation for loss I had sustained through the game, and asking for some one to be appointed to assess the amount, so as to avoid litigation. On the 7th July I had my crops valued by Mr. Richards, as I had received no answer. On the 13th Mr. Hickman told me I had behaved very shabbily in not signing the agreement. I pointed out the field where damage had been done to Mr.

Richards. In due course I had my crops harvested; and they were advertised for sale for the 30th September. On the 26th of that month I received a notice to quit from my landlord, and on the 28th I had a letter from defendant's attorney. The sale took place on the 30th. Two friends, Mr. Montiby and Mr. Ruddler, attended for me, and bought in the corn. Mr. Hickman was present. I rely on the valuation made by Mr. Richards. I sold the wheat grown on 13a. 39p. of land (40 bags and half a bushel). The land was well manured and good seed; and there ought to have been about 130 bags.

Cross-examined by Mr. Huddleston: It was useful land, and I sowed about three bushels to the acre. That was not too much. The letter of the 21st of May is not in my handwriting. It was written by a friend of mine at the Peacock Hotel, at Wolverhampton. The letter of the 5th of July was written by my attorney's clerk. Mr. Hickman showed me a printed form of agreement. I did not read it. That agreement did not concern me. Mr. Hickman said he would prepare one for me. He (Mr. Hickman) did not say that the farm was so situated that there was sure to be some damage as far as the rabbits were concerned. He did not state that if the keepers did not keep down the rabbits the tenants were to inform Mr. Lloyd in order that he might see that it was done.

Mr. THOMAS FURBER: I am a farmer, living near Whitchurch. Remember going with my son (plaintiff) to see the Leaton-hall farm in 1860. Dined with Mr. Hickman, and then went to his (Mr. Hickman's) office. Told him we had heard in Shrewsbury that the farm was overrun with rabbits. Mr. Hickman said Mr. Lloyd had authorised him to say that there should be no damage done by the rabbits or game. My son, on that promise, agreed to take the farm at 25s. an acre, but said it could not be well-farmed according to the custom of the country without following some of the land. Mr. Hickman said he had no doubt Mr. Lloyd would not object, and stated that he would prepare an agreement.

Cross-examined by Mr. Huddleston: Saw Mr. Hickman at Whitchurch on the 9th of May, 1861. He wished me to sign the agreement. I did not do so. When my son spoke about the rabbits, Mr. Hickman said they had been having them killed, and no damage should be done. Mr. Hickman produced a printed form of agreement, and read a portion of it.

Mr. JAMES RICHARDS: I am a farmer and corn dealer, and reside at Eccleaton. I was employed by plaintiff in July, 1862, to make an examination of his crops. I went over the various fields, and saw that damage had been done, which I estimated at £170.

Cross-examined by Mr. Huddleston: I had made two or three valuations of game damage before—one for Mr. Brindley, in the Corve Dale; and another for Mr. Gibbon, at Eccleaton. I have been farming all my life; but at present I only farm about twenty acres of my own. For the past ten years I have only farmed that. Do not charge for my valuations; do it in a friendly way.

Mr. WILLIAM JONES: I am an auctioneer at Tong. I was employed by Mr. Furber to sell the produce of the farm in September, 1862. The crop in a field of thirteen acres was much injured by game—to the extent of from ten bags to the acre to what it did produce. Do not know what it did produce. Saw a great many rabbits in a field near the wheat crop.

Cross-examined by Mr. Huddleston: I am a farmer, and consider that ten bags to the acre on a fallow field would be a moderate crop.

The plaintiff was recalled, and said he had seen a great quantity of game and rabbits on the farm. Had counted as many as 28 hares and 100 rabbits on one field. In cross-examination he stated that he had complained to the keeper, and had gone with him to watch the rabbits.

This being plaintiff's case, Mr. Huddleston addressed the jury for the defendant, alleging that he (Mr. Lloyd) had never entered into a contract to remunerate a tenant for damage done by game, and that no contract had been entered into in this instance; and contended that, such being the case, plaintiff had no ground of action. He called

Mr. WILLIAM HICKMAN, who said: I am land agent to the defendant, and have been so about 11 years. In 1860, the Leaton-hall farm was to let. Plaintiff had called upon me in November of that year about that farm. I told him that there had been a frequent change of tenants, and I should be sorry for him to take it, as I did not think it would answer his purpose, and I should not like him to lose money by it.

Informed him that Mr. Lloyd had taken 40 acres to lay down. Subsequently he called again, and I stated the rent and other circumstances. He thought it would suit him, and agreed with me that it was best adapted to dairy purposes. He agreed to take it; and I asked his (plaintiff's) father if he would join him, and he stated that he would. I then produced a blank form of a printed agreement. I showed it to Mr. H. Furber, and he had it in his hands some time, as though he was reading it. I told him it was the same agreement all Mr. Lloyd's tenants had, and I would get it filled up. Plaintiff spoke of the game and rabbits after he had read the agreement. He said he understood that farmers were liable to much damage from them. I replied that there was sure to be some damage, the farm was so situated, but that Mr. Lloyd, as far as regarded the rabbits, wished them to be kept down; and that if they were not so kept down complaint must be made to me, and I would communicate with Mr. Lloyd if the keepers did not then attend to it. Said I thought they were not so numerous as in previous years, as two additional men had been employed for about two months in the year. Did not say that Mr. Lloyd had promised that no game or rabbits should be kept on the farm to injure the tenant. I afterwards filled up one of the agreements, and informed plaintiff that it was ready. He said that when his father came over they would both sign it. When plaintiff had been on the farm several months he called at my house, and I reminded him that he had not signed the agreement. He answered that I need not be afraid, as he was not going to overrun me. I saw him on the second of May, 1861, and had the agreement with me. Asked him to sign it, and that I would then take it to his father. He inquired when I should be at Whitechurch, and I replied "On the 9th of May." He said he would meet me there, and make it all right. He gave no reason for not signing it then, and made no objection at all. I went to Whitechurch on the day I had named, and saw the elder Furber. Asked him to fetch his son; but, although I waited about two hours, they did not come to me. Met plaintiff on the 19th May. Asked why he did not fulfil his appointment, and he answered that it was of no use his doing so, as he did not intend staying at the farm. He added that he had intended to sign up to Christmas, and asked if Mr. Lloyd would allow him anything for the damage for game. He had not claimed for damage before, but had said that the rabbits had eaten some vetches. Told him I could not make any promise as to an allowance, and he then stated that he would let me have his determination by letter in a few days. I did receive a letter intimating that he (plaintiff) should give up the farm. In February, 1862, I told plaintiff that Mr. Lloyd would give him £50 for bone manure.

Cross-examined by Mr. Sergeant Pigott: Plaintiff consented to sign the agreement, and never said anything about a counter agreement. In November, 1861, he spoke to me about the rabbits having eaten some vetches. I spoke to the keepers about it. The agreement was to farm on the four-course system. Don't recollect what passed about the four-course system. Do recollect what passed about the game. The rabbits have perhaps "bothered some of the tenants a little."

Mr. THOMAS HICKMAN, son of last witness, spoke to plaintiff promising to sign the agreement prepared, and stated that he (plaintiff) said nothing about a counter agreement.

Mr. Huddleston summed up the defendant's evidence, and Mr. Sergeant Pigott addressed the jury on the whole case. He argued that if they (the jurors) believed that Mr. Hickman, as agent of defendant, stated that no damage should accrue from the rabbits and game, that was binding on Mr. Lloyd, and was as good for the purposes of the action as though the contract had been in writing.

His lordship summed up at some length, calling attention to the evidence as it bore for or against the plaintiff, and put it to the jury at length that the real question was whether there was a contract or not.

The jury consulted for about half an hour. On their return into court a verdict for plaintiff, damages £100, was announced.

HORSE WARRANTY.

At the Lincoln Assizes the case of Tomkins v. Davy was tried. Mr. Huddleston, Q.C., and Mr. Fisher were for the plain-

tiff; Mr. Sergeant Pigott and Mr. Dowdell for the defendant.

The action was brought for a breach of warranty of a five-year-old bay gelding, sold by the defendant, a farmer of nearly 2,000 acres of land in Lincolnshire, and a breeder of horses there, to the plaintiff, the keeper of a horse repository and auctioneer at Reading. The plaintiff gave £87 for the horse at Lincoln fair in April last, and the defendant then gave him a written warranty that the horse was "perfectly sound, free from vice, no crib-biter, rearer, or windmiller." The horse was sent from Lincoln to Reading by rail on the 23rd of April. Two days afterwards the plaintiff sold him conditionally to the Rev. Mr. Austen Leigh, the "Vicar of Bray," for what was equivalent to £85. Mr. Leigh and the plaintiff's breakman took him out for a trial drive, but upon Mr. Leigh stroking him down with the whip the horse showed signs of kicking; and two days afterwards, when Mr. Leigh made another trial of him in his parish, while his servant was walking up and down (Mr. Leigh being in the parish school to which he had driven), upon the servant whisking the whip over the horse's head he sprang forward, kicked, and upset the phaeton in which he was. The horse was then returned to the plaintiff, and was by him soon after put up for sale by public auction, but bought in at 41 guineas; but upon the plaintiff's trying him again in his break on the 13th of May, he again set to kicking, and, according to the plaintiff's witnesses, most viciously.

For the defendant seven witnesses were called to show the history of the horse, which had been bred, broken in for the defendant, and ridden and driven by the defendant and his servants up to the time of the sale, and had been driven not long before by the defendant's father, a gentleman of 80 years of age; and that the horse was free from vice at the time of the sale at Lincoln fair; and the defendant contended that the kicking at Reading must be attributed either to freshness (the horse had been laid up some weeks before the sale), improper harnessing, or from some trick that might possibly have been played him on the railway journey to Reading.

The learned judge summed up, and the jury found a verdict for the plaintiff for £81.

GAME LAWS AND DEPREDACTIONS BY GAME.

SIR.—A petition to parliament from the Frobenham Farmers' Club states that so much as an eighth, and in many cases so much as a sixth of the value of the crops is destroyed on many of the farms by game; and the petition goes on to say that this holds out the prospect of very great injury to all, and ruin to many of them. And there is no denying the fact that this state of things is just what is carried out in hundreds of other localities in Scotland as well as England. Oh, but this game is a sacred thing; it is reared for sport. Well, so be it; but that is a word I would rather not mix up with the question at all. Let us see at least what it is to the farmer. Take an arable farm of 300 acres farmed on the five-course rotation. Here we have

200 acres in corn.
100 acres in turnip.
100 acres in first year's grass.
100 acres in second year's grass.

In place of taking the damage at an eighth or a sixth, as stated in the petition, we will strike the average, and take it at a seventh; and, besides, we will just stump the corn and turnips, and take the whole at the moderate price of £6 per acre.

300 acres div. by 7 = 43 acres nearly $\times$ £6 = £258. This amount is for the corn and turnips; I shall leave it for the landlords to say if the proportionate damage done to the remaining 200 acres of grass will not swell the sum to £300. £6 per acre is not a large sum, but it will be found a pretty fair average for present prices. And before the farmer pays the endless list of expenses for labour—men and horses and other workers, implements, manures, &c., and rent—and add to all £300 game account, and without saying anything of various dirty annoyances connected with it, you have what fully just-

for the terms of this petition, and what would justify others from hundreds of other places.

The ill consequences of such a state of things stand out before the face of every one, in the clearest sunlight, in all their ugliness. It's needless to speak of them. It's not easy to say whether they will be most disastrous to landlord or tenant in the long run. One would like ill to see the spell

broken that has so long associated game with the field sports of the higher classes. But, plainly, this will be one of the results of such a state of things. There are many others equally plain which it is needless to specify. There are many evils that can neither be got quit of nor rectified. This is not one of them.

July 27, 1893.—*North British Agriculturist*.

FOREIGN AGRICULTURAL GOSSIP.

There is nothing like chit-chat to receive the more solid heavy matter which every journal must give. To commence, then, this week with one of these lighter paragraphs we may notice that on the occasion of the *Fête* of the Emperor several decorations were awarded to gentlemen associated more or less closely with agriculture. Thus the following chevaliers of the Legion of Honour have been promoted to the grade of officer: M. Dubonays de la Bégassière, for thirty-three years administrator of forests; the Marquis de Croix, for distinguished services rendered in connection with the breeding of horses in France; and M. Ephrem Houel, inspector-general of breeding-studs. The following have also been named chevaliers: M. Charles Joseph Desmercière, conservator of forests at Moulins, in consideration of thirty-five years' service; M. Antoine Auguste Mathieu, inspector and professor of natural history at the forest school of Nancy, in consideration of twenty-eight years' service; M. Miguel Dalton, director of the imperial dépôt of stallions at Villeneuve-sur-Lot; the Comte de Germiny, in consideration of the active and enlightened assistance which he has rendered for several years to horse-breeding "industry"; and M. de la Housaye, director of the imperial dépôt for stallions at Sin. In referring last week to some of the results achieved by French breeders at the Hamburg International Agricultural Exhibition, we were led into one or two errors. The Baron de Maltzahn cultivates 10,000 and not 1,000 acres of land. M. Garnot, of Genouilly, also sold one of his rams, it should be stated, at the stiff price of £160, two others making £60 each. The sudden death is announced in Corsica of M. Doyère, a gentleman who had devoted great part of his life to the study of processes in connection with the preservation of grain. Death came suddenly upon him before he had completely succeeded in practically developing his ideas to the full extent; and although it has been said that great questions always secure themselves a solution, if not by one man then by another, it is also certain that persevering men advance matters many years, and sometimes even centuries. It is to be regretted, then, that M. Doyère was not permitted to bring his work to a close. He was born in 1811, in Calvados, and was for a long time professor of geology applied to agriculture at the agricultural institute of Versailles. Besides different memoirs on the varied aspects presented by natural history, France owes to him various works on milk, insects, &c., which have been of much utility in connection with agricultural progress. A great number of agricultural exhibitions are still proceeding in France. At one of these—that at Valognes in the Manche—the programme contains a clause which stipulates that the proprietors of animals which may receive premiums shall be obliged to keep them up to the Exhibition of 1894, and to show them then. Those who do not fulfil this condition, except under circumstances recognized by the society, "must repeal the premium obtained, plus the totality of the whole premium," by way of amends: that is, any one who may obtain a prize of £4 and who fails to comply with the requirements imposed, must pay £3 to the treasurer of the society, at Valognes,

before Sept. 1, 1894. This regulation applies to bulls and colts 2½ years of age; as regards other animals, the "totality" gives place to one-half. At another gathering to be held in the arrondissement of Rochechouart, in the department of the Haute-Vienne, prizes will be awarded to those landowners who may have purchased the most farm-yard manure for the improvement of their properties. Some trials of reaping machines have taken place this month, upon the imperial farms of Champagne, under the auspices of the central agricultural committee of the department of the Marne. The prizes were awarded by the jury as follows:—First premium, a gold medal and £8, to M. Lallier, of Venizel, for his two machines, one of which performed the binding and the other the actual cutting of the corn; second premium, a silver medal and £6, to M. Duchâteau, president of the agricultural committee of the arrondissement of Rheims, for his reaper, effecting cutting operations only; and third premium, a bronze medal and £4, to MM. Albaret et Cie., for a Mac Cormick apparatus for binding. An honourable mention was also accorded to M. Fortén, of Chapareillan, in the Isère, for a binding machine. A sale of eight Ayrshire bulls, born between Aug. 26, 1861, and Dec. 14, 1862, from the Saulsaie imperial school of agriculture is announced for Sunday, Aug. 30 (always Sunday!). There are doleful complaints with respect to forage prospects in France. Not only was the first crop a failure, but the drought which has prevailed for several weeks has prevented all possibility of a satisfactory aftermath.

We have now reached the last, we believe, of the district agricultural exhibitions organized by the French Government, viz., that held at Chambéry. The meeting promised, from the preliminary declarations sent in to the Minister of Agriculture by breeders, to be one of the most remarkable held in 1893; but, unfortunately, the postponement of the "solemnity" to the first few days of June prevented a portion of the cattle originally entered presenting themselves at the exhibition, the general annual migration to the mountains having been accomplished, and only a small number of beasts remaining in the valleys. This caused a great many of the stalls provided to remain empty. While the visitor was enabled from the specimens entered to appreciate the beauty of some cows and bulls of the Tarentaise breed, one could but wish to have had an opportunity of studying the breed in a more complete manner. The same remark applies to another breed, however, under the name of the "Race d'Abondance," which is very widely spread through the Haute-Savoie, but which completely made default at the meeting. Meteorological influences, too, did not favour the exhibition, for in consequence of almost constant rains it was difficult for the distant visitor to the department to render an exact account of the state of agriculture in Savoy. The question deserves the closest attention on the part of agriculturists, as the competition which took place for a departmental prize of honour showed to the jurors who visited the competing farms, that the rent of land was generally not less than £5 to £6 per acre—an enormous price even when compared with that current in the richest French depart-

ments. The high figures may be doubtless explained by the importance which the culture of vines and the rearing of cattle have acquired in Savoy, and also by the sober and laborious habits of the population, who consume comparatively little, and through sheer hard work produce a great deal. But this is not all: every possible improvement has been realized on many estates, and among the whole rural population of France there are few who have shown themselves more desirous of making progress than the inhabitants of these mountains. Improved agricultural machinery has been brought into the district, as it were only yesterday, but already it is accepted favourably, although perhaps a desire is shown to simplify it too much. When the roads which the Government has planned are carried out, the Savoy district will not only be one of the most grand and picturesque in the French empire, but it will also be one of the richest. The majority of the departments to which Savoy is annexed were not very well represented, but an exception must be made to some extent as regards the Ain and the Allier. In this last department, which bore away a great number of the prizes awarded, not only landed proprietors but also the class of farmers known as *métayers* came forward. This must be regarded as a remarkable indication of agricultural progress, since as soon as *métayers* take an active part in the general agricultural movement, their system of tilling the land will cease to merit the reproaches which have formerly been heaped upon it. The prize of honour for the best general farming in the district went to M. Henri Ract, a landed proprietor at Montmeillerat, in the canton of Montmelian. A sum of £200 and a silver cup of the value of £120 were awarded to Mr. Ract, in accordance with the usual practice. We have alluded at the commencement of this roundabout paragraph—and roundabout writing is, perhaps, excusable in what professes to be only gossip—to the Tarentaise breed; and it may be interesting to hear what M. Cochon, an old pupil of the Grignon school of agriculture, has to say on the subject. M. Cochon observes: "In consequence of the annexation

of Savoy to France, a pure breed, which had previously been only classed in the exhibitions of the district, has increased the number of French cattle races. This breed, which inhabits the high portions of the department of Savoy separating us from Piedmont, has some qualities which commend it to the attention of agriculturists. It seems now positive that this breed has been imported from the canton of Schwitz; male reproducers, however, alone implanted it in this part of Savoy. These animals have very decided characteristics, which enable them to be easily recognized. The prevailing colours of their hides are a slaty grey; but the ends of their nooses, the tips of their horns, and the lower part of their members, are black, while all, without exception, have a whiteish streak more or less large running from the nape of the neck to the springing point of the tail. These general characteristics are also those of the Schwitz breed. The Tarentaise is, however, less perfect in its shape than the Swiss breed; its chest is shorter, the belly is large, and the members thick and short, while there is also less fineness about the hide. The Tarentaise breed, however, commends itself, by its lactiferous qualities, its aptitude for labour, and its "rusticity," which enables it to resist the hard and sad conditions under which it has to live. There is, also, no doubt that the breed, if brought into the plains and submitted to a more substantial food regimen, and to intelligent attention generally, would rapidly acquire all the qualities which distinguish the Schwitz breed. The jury regretted that the postponement of the exhibition should have prevented a large number of breeders from showing the animals which they had entered. The presence of a larger number of specimens would have enabled a better appreciation to be arrived at of a breed which deserves on all accounts the attention of cultivators who seek to produce animals yielding simultaneously plenty of milk and plenty of work." Among the other cattle classes at the show some bulls and cows of the Fémeline, Durham and Ayrshire breeds were especially noticeable.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Sow salads, as mustard and cress, twice; radish; lettuces in frames; and transplant lettuce, to stand on ridges all winter. Constant attention to weeding is required; for at this time the garden will be much infested with chickweed, groundsel, and similar quick weeds. Dig, trench, and ridge spare grounds. Manure and prepare plots for artichokes, sea-kale, asparagus, and rhubarb. Carry away and clear the garden of haulm, and take all to the rotting compost heaps.

Dig potatoes carefully. Pick out the worthless and diseased. If not wholly infected, a sprinkling of lime will ensure propagation.

FRUIT DEPARTMENT.

Prune back to within three or four eyes the projecting shoots of apple, pear, plum, and

cherry-trees, as far as to aid the swelling of fruitful buds.

At the end of the month plant young fruit-trees in nicely-wrought fresh loam, or turfy soil, which retains trees in a strong health. Mulch freely over the surface of the roots.

Pot strawberries for forcing, and make new plantations in deeply-wrought new lands.

FLOWER GARDEN.

Remove and re-pot the greenhouse plants. Plant slips of herbaceous flowering plants.

Destroy all weeds by hoeing and raking, and produce a neat order in every part of business, which is so pleasing during the repose of winter, and which must be done before the land ceases to be wrought.

Clip hawthorn and other fences; renew and plant box edgings; and mow and roll the lawns.

CALENDAR OF AGRICULTURE.

This month finishes the harvest over the United Kingdom, only in the very latest localities protracted into the following October. Wheat, oats, barley, and peas are cut and carried, as has been directed. Cut beans by the hand-sickle. Tie the crop into sheaves with straw ropes, or of tarred twine, which will last for some years. Carry the crop when dry, and build it into ricks, or lodge it in barns. Thatch all ricks quickly. Rake the rickyard clean, and carry the rubbish to the dung-yards. Employ plenty of hands in harvest, and reward them liberally.

Gather fruits, as pears and apples. Pick hops. Use the haulm for litter, and place the poles under cover, for another year. Dry with coke: some use sulphur to give hops a yellow tinge.

Plough the wheat fallows; and towards the end of the month begin to sow. Finish the laying on of dung and composts. Plough leys for wheat; and scuffle the bean and pea grattans, as a preparation for wheat-sowing. Prepare, by fallowing, the lands intended to be planted with early spring crops, as potatoes, Swedish turnips, carrots, and parsnips. Lay the dung into drills or in broadcast. If in drills, it only remains to reverse the ridglets in the spring, and plant the crop upon them: if in broadcast, the land will require a

ploughing before being drilled. The autumnal preparation of land much facilitates and expedites the spring operations; but only the early climates admit the use of it.

Scarify the surface of lucerne, before laying upon it the well-pulverized composts. Spread the dung over the surface very carefully and evenly, bush-harrow it, and then roll it heavily in dry weather. Such treatment will secure an early spring vegetation.

Collect manures by every means to the liquid-pit and to the compost-heap. Burn for ashes, and keep them under cover.

Towards the end of the month sow rye for a seed-crop, and also for being eaten on the ground in the spring. Sow winter tares mixed with rye, or winter beans, or winter barley, on lands clean and in good heart, or on a partial fallowing, with dung.

Scour roadsides; clean out open ditches, to be ready for the winter floods; enlarge the courses of brooks. Use all the excavated materials for composts, the earthy parts mixed with lime, and the vegetable portion burned into ashes. Omit no opportunity of collecting manures in any form or quality.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR AUGUST.

The continuance of remarkably fine weather has enabled our farmers to progress rapidly with the cutting and carrying of wheat in the whole of the leading counties. So rapid has been the progress, that up to this time nearly or quite two-thirds of the entire crop have been safely stacked. As regards its general quality, we may venture to assert that it has seldom been equalled; indeed, scarcely an inferior sample can be met with; whilst, as respects the productiveness of the crop, we may observe that it is all that could possibly be desired. On most of the light lands the produce, on the average, is equal to nearly $5\frac{1}{2}$ quarters; on the heavy lands, $6\frac{1}{2}$ quarters to the acre. On thrashing out the crop, very little "tail" wheat is discovered, so that a more valuable produce has not been grown in a long series of years.

The barley crop, though somewhat light in some districts, is fully equal to last season, both as regards quantity and quality. There will, therefore, be a large supply for our maltsters to select from, during the coming season. Oats are considerably above an average crop; but the yield of beans is somewhat deficient. Peas, however, are very abundant, the produce on some of the lands in Essex having amounted to six quarters to the acre.

Although it is pretty generally supposed that potatoes will turn out somewhat small in size, it is admitted that the growth is a very large one, and that it is of unusually fine quality. No signs of disease are reported in any quarter. On the continent, the crop is by no means so abundant as in this country; consequently, very moderate shipments are anticipated.

The grain trade, generally, has been in a most inactive state. Thrashing having progressed steadily, most of the

markets have been well supplied with new wheat, for which the demand has fallen off, notwithstanding the limited quantities of old held by the millers, and prices have given way from 3s. to 6s. per quarter. Barley, however, arising from the limited receipts of both English and foreign, has maintained previous rates; but oats have fallen 1s. per quarter. Both beans and peas have moved off slowly on former terms; but flour has declined from 2s. to 4s. per 280lbs. American qualities have ruled heavy at further depressed rates.

Letters from Scotland state that harvest has been commenced in various districts, and that the crops, especially of wheat and barley, are coming down well. Potatoes are represented as a very fine crop; consequently, large quantities will find their way to the London market during the winter months.

In Ireland nearly a moiety of the crops has been carried; but, from all the information we can collect, the new produce is not likely to turn out either large in quantity or fine in quality. Potatoes, however, are a much larger crop than last year, and, for the most part, they are free from disease.

Harvest work on the continent (more particularly in France) has been actively carried on. Wheat, with very few exceptions, is a heavy crop; and the yield of barley, oats, seeds, &c., exceeds 1852 to some extent.

From America, we learn that the bulk of the wheat has been secured, but that the want of labour has materially interfered with the produce, which has been forwarded to the various markets in a foul state. Our impression is that American shipments, now that prices are unusually low in this country, will be on a diminished scale during the remainder of the year. We must bear in mind, however, that the continent has a large surplus quantity of food on hand, and that an advance in the quotations here would lead to somewhat heavy arrivals from France and Germany.

The turnip crops are looking well, considering the extreme dryness of the weather. Swedes and mangolds promise an average growth. It may, however, be doubted whether it will equal last year.

A few pockets of new hops have been disposed of, in the Borough, at from £8 8s. to £12 per cwt.; but the bine, though it has considerably improved in appearance since the rains commenced, shows only a moderate crop. The demand for most kinds has been in a sluggish state, but no change of importance has taken place in prices. Rather large quantities of foreign hops still continue to arrive. On the continent, the growth is quite equal to last season. We may therefore anticipate steady importations for some time.

The markets have been but moderately supplied with hay and straw, for which the demand has ruled steady, at full prices. Old meadow hay has realised £3 10s. to £4 10s., new ditto £3 to £4, old clover £4 10s. to £6, new ditto £4 to £5, and straw £1 8s. to £1 18s. per load. The whole of the hay has now been carried in excellent condition.

The public sales of colonial wool—at which about 109,000 bales have been disposed of—have been brought to a close. Throughout, the bidding, both for home use and export, were somewhat active, and prices generally were well supported. The market, privately, continues steady, and, considering the great activity in the woolen trade, the stocks of home-grown wools in the hands of the manufacturers are very moderate.

The crop of apples is a very moderate one; but of other kinds of fruit it is equal to most previous years.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that the leading markets of consumption have been somewhat heavily supplied with beasts, both English and foreign, the demand for most breeds, but more especially for prime stock, has ruled tolerably active, and the quotations have been well supported. Compared with the two previous months, the beasts have come to hand in but middling condition; but it is gratifying to observe that less disease has been apparent amongst them than was the case at the corresponding period last year, and that the losses have been far less numerous. With regard to the sheep, we may observe that their general quality has slightly fallen off. On the whole, however, it has turned out tolerably prime. The mutton trade has continued in a healthy state, and, in some instances, the currencies have ruled a shade higher. The demand for lambs, though it has not been very active, has been somewhat firm; indeed, we seldom recollect a season during which such high prices have continued to prevail. Some Down lambs have produced as much as 7s. per 8lbs., which, for an advanced period as regards the season, is an unusually high figure. The veal trade, owing to the large importation of calves from the Continent, has been in a very inactive state; whilst pigs have commanded very little attention, at about stationary prices.

The quantity of grass in the pastures has fallen short of last season, owing to the long continuance of dry weather; but the fine rains which have recently fallen have had a most beneficial effect upon the root crops, which have rapidly recovered from the effects of the late want of moisture. At present, there is every prospect of a large growth of swedes and other turnips; and we may observe that the hay crop, though not equal to last year as to quantity, has been secured in excellent condition. This is an important element in stock feeding. For the most part the pastures are well stocked with both beasts and sheep, so that we do not apprehend any serious falling off in the supplies during the remainder of the year. Evidently, however, prices will continue high, arising from the enormous consumption going on.

The imports of foreign stock into London have been as follows:

	HEAD.
Beasts	9,502
Sheep	34,927
Lambs	4,125
Calves	4,327
Pigs	4,108
Total	56,999

COMPARISON OF IMPORTS.

Aug.	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
1862	5,630	30,652	5,204	2,060	2,297
1861	6,581	32,210	3,176	1,874	3,718
1860	6,647	36,349	1,856	2,520	4,075
1859	6,502	29,175	3,308	3,254	1,805
1858	8,293	19,500	2,764	3,512	2,935
1857	4,692	21,215	1,780	2,681	2,338
1856	5,677	17,801	1,271	2,301	1,901
1855	4,341	23,905	984	2,464	2,476

The total supplies of stock exhibited in the Great Metropolitan Market have been as under:

	HEAD.
Beasts	26,264
Cows	530
Sheep and Lambs	149,430
Calves	3,070
Pigs	2,629

COMPARISON OF SUPPLIES.

Aug.	Beasts.	Sheep & Lambs.	Calves.	Pigs.
1862	24,072	154,920	2,354	3,012
1861	23,420	159,740	2,932	3,220
1860	22,290	151,500	3,846	2,070
1859	22,170	165,090	3,338	2,320
1858	26,915	151,530	2,127	2,510
1857	20,695	143,758	3,173	2,450
1856	21,271	147,250	2,354	2,875
1855	20,816	151,670	3,358	2,272

Beef has sold at from 3s. 4d. to 4s. 10d., mutton 3s. 6d. to 5s. 2d., lamb 5s. to 6s. 8d., veal 5s. 4d. to 4s. 8d., and pork 3s. 6d. to 4s. 6d. per 8lbs. by the carcase.

COMPARISON OF PRICES.

	Aug., 1860.	Aug., 1861.	Aug., 1862.
Beef.....	from 5 0 to 4 8.....	3 0 to 5 6	3 0 to 5 6
Mutton	3 2 to 5 0.....	3 8 to 5 4	3 8 to 5 4
Lamb	4 4 to 6 0.....	5 0 to 6 4	5 0 to 6 4
Veal	3 4 to 5 0.....	4 0 to 5 0	4 0 to 5 0
Pork	3 6 to 4 8.....	3 8 to 4 10	3 8 to 4 10

Advices from most parts of the Continent are to the effect that stock is by no means abundant, and that prices are somewhat high. We understand, however, that fair average shipments will be made to England in September.

The comparison of the arrivals of home-fad beasts for the Metropolitan Market stands thus:

	Aug., 1860.	Aug., 1861.
From Lincolnshire, Leicester-shire, &c.....	12,700	14,000
Other parts of England ..	8,000	4,000
Scotland	311	101
Ireland	1,980	600

Very limited supplies of meat have been on offer in Newgate and Leadenhall markets. Prices have fluctuated considerably, but on the whole they have been well supported.

WESTMORELAND.

Our prospects are somewhat cheering, having had the finest hay-time for many years; yet, all hands being amongst the hay, neglected singling the turnips, which, on dry soil, did badly for some weeks; however, rain came just in time to restore them, and now, August 19th, the offer is for a rattling crop, both swedes and yellows. Mangolds and carrots will be only a moderate crop. Beans are very good. Peas are also plentiful, especially the field grey tribe. Linseed is a moderately good crop, with a larger breadth sown than previously. Potatoes were largely planted, and offer well for an abundant crop, yet on the low lands frost did much damage. Barley is a capital crop, and can, although rather short in straw, be "corny," and will yield largely of meal. Wheat is an excellent crop—plenty of

standing straw with plump heads, which cannot fail to produce a deal of fine flour. As the weather is dark and showery the early crops are kept back. On return of sunshine barley and wheat will be out with all speed, with the oats following closely behind.

SOUTH LINCOLNSHIRE.

We are now satisfactorily progressing through a remarkably fine harvest season. The winds have been rather too boisterous for the standing crops of bold ripe wheat, and some loss has been sustained from shelling. We have had a few showers, but the country is sadly parched up, and neither water nor food can scarcely be found for the stock. Many farmers are taking their cattle into their foldyards, and giving them straw and cake. It is long since we have had such a dry season. The fens and fen-land districts, not supplied with water from "the high country," are suffering much inconvenience. They are like open commons—the stock all running together, neither fence nor water for miles. The marshes are in a similar predicament, but they being mostly fenced with white thorn hedges, the inconvenience arises chiefly from want of water. The water-cart is in constant requisition. The stock, of course, suffer severely, and we are anxious to see the corn fields clear so as to afford a little aid in weeding stubbles, &c. We are now better able to report upon the harvest here. The wheat crop is undoubtedly a good one, but it by no means comes up to the high expectations of the growers. The crops cut up much lighter than was anticipated, nor is the ear so well filled as was expected. It will be a fair average crop and no more; the weight and quality of grain very good. The oat crop is various; the early sown very good, late sown patchy and light. The quality of grain will be good and heavy. Barley proves a good crop, but it is not much cultivated in the district. Beans are the most irregular in crop this year. Some crops are very good, and well podded; others, fair bulk but badly podded; others, neither bulk nor pods to any extent. Peas are a good crop throughout, but not an extra one. Potatoes still look flourishing upon the whole, and although a few crops have lost their haulm, yet we scarcely hear of the disease. It does exist, but has not done much damage yet. The crop is large in bulk and breadth, and likely to prove well. The "green crops," as a whole, are unsatisfactory. Swedes are suffering severely from "grubs," very many are eaten off about an inch below the surface. All want rain sadly. The supply of fat meat must soon be very short. All kinds of stock are doing so wretchedly that a scarcity must soon occur.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ASPATRIA SHEEP FAIR.—There was a good show of lambs, but the holders demanded prices so high that very little business was transacted. Bred lambs were scarce.

BANBURY FAIR.—The August fair is the great sheep fair, especially for breeding stock: and the present one, both as regards the quantity of sheep on sale and the business done, kept up its character. The supply of sheep was large. In the best market there was also a good number of all descriptions. Beef averaged from 3s. 6d. to 4s. 6d., and mutton from 4s. to 5s. the 8lb. The ram sales were as usual numerously attended, and the higher qualities of tups realized good prices. Mr. Jonas Paxton opened this part of the business by disposing of rams belonging respectively to Mr. Root, of Great Tew, and Mr. Mills, of Signett Burford. Those of Mr. Root were the primest sheep, and averaged £9 8s. 7d. a head; while those of Mr. Mills fetched £7 13s. 1½d. a head. Mr. Lyne then knocked down a score of shearlings, the property of Mr. Hughes, of Duntrop, at prices varying from 4 to 10 guineas. The great attraction in the ram sales was, however, those of Mr. Craddock, of Northleach. There were twelve rams of this flock, and the highest reached 11½ gu., the average being about 10 gu. Mr. Fowler sold a score of Cotswolds, the rams of Mr. Bull, of Drayton, which also fetched over 6 gu. a head.

BRIDGNORTH FAIR.—The show of cattle and sheep was small. Cows for the knife realized 7d. per lb. Good wethers fetched readily from 6½d. to 6½d. per lb. Cows and calves from £12 to £15. Good store pigs from 30s. to £2.

In the horse fair none but agricultural animals, and large prices asked. But little business done.

BURGH-LE-MARSH FAIR was largely supplied with stock, and the best animals, both beasts and sheep, realized about former rates. Half-fatted, of which, in consequence of the great scarcity of keeping in the marsh, there was a large number shown, were very slow of sale, and several at the close were undisposed of.

DONCASTER FORTNIGHTLY MARKET.—A small attendance of purchasers, and but a limited show, as farmers were too busily engaged with the harvest, which is progressing satisfactorily. Fat sheep ruled from 6½d. to 7½d. per lb., the latter being paid for wethers. Fat beasts sold at from 7s. to 7s. 9d. per st.

DUFFTOWN MARKET was not nearly so large as usual at this season of the year. There was a considerable number of dealers present, and the demand brisk, but the supply of cattle was limited. The market was stiff in the early part of the day, but latterly most of the lots were sold at fully current prices. Good fat may be quoted at from 60s. to 62s. per cwt. The supply of ewes and lambs was large—chiefly from Inveravon and Badenoch—and numerous sales were effected at prices ranging from 4s. 6d. to 11s. 6d.; average from 7s. to 9s.

DUNHAM FAIR.—At the commencement of business farmers asked very high prices, but soon afterwards dropped as much as £3 a head, and ultimately a fair business was done at from 7s. to 8s. per st. There were plenty of store beasts, but business was flat, owing to the want of keep. The quantity of fat sheep was limited, but quite equal to the demand, at about 7d. per lb. The business done in store sheep was a flat one, but for the best of them as much as from 40s. to 50s. a head was obtained.

ELGIN MARKET.—The market was stiff, the prospect of a good turnip crop making farmers less anxious to dispose of their stock than they otherwise would have been. Fat sold at 62s. or 63s. per cwt.

GLENDON SHEEP AND LAMB MARKET.—The following were about the average rates: The best lots of cross-bred lambs brought from £15 to £17 per clad score; seconds ranged from £11 to £13 10s., and thirds from £7 to £10 per clad score. The highest price we heard of for half-breds was 24s. a-head, and others ranged from 18s. to 22s. each, according to condition. There were but few blackfaced lambs shown, and these were principally shotts, the prices of which we could not learn. The sheep shown were in pretty good condition, and sold quickly about the rates of recent markets.

GLOUCESTER MONTHLY MARKET was very indifferently supplied with fat stock, and good sheep were very scarce, and realized high prices. Beef was in a moderate supply, and the best quality sold readily. The following were the quotations: Beef from 6½d. to 7½d., mutton from 7d. to 8d., lamb from 8d. to 9d. per lb.

HEREFORD FAIR.—There was a very large attendance, especially in the sheep department, which was well supplied with store stock. Fat sheep and also lambs were very scarce and in good demand. Both fat and store sheep sold briskly, fat ewes at 7d. and wethers at 7½d.; store ewer, 36s. to 44s.; lambs, 25s. to 30s. Mr. G. Taylor sold a lot of wethers at 52s. Fat beasts sold briskly at 6½d. to 7d. per lb. There was not a large number of store cattle, and prices showed a downward tendency in consequence of the shortness of keep. Pigs were rather cheaper. There were some pretty good animals in the horse fair, but trade was rather slack.

HORNCastle HORSE FAIR.—The show of horses exceeded in the aggregate many preceding fairs, and comprised a varied description of horses of the highest fashion and usefulness. Lincolnshire produced a large field; Yorkshire contributed some handsome cattle, and the great show was completed by a large importation of horses from Ireland. For horses of the highest order there was no diminution in value, but horses of secondary description came much easier. Well-grown young horses rising four and five years, unbroke to double harness, but adapted for private carriage purposes, 50 to 75 gu.; fine upstanding ditto, of good symmetry and settled down in harness, 70 to 80 gu.; and matched pairs of bays and greys, &c., 160 to 180 gu. and upwards; neat going light-legged, active horses for small broughams, phaetons, &c., 45 to 55 gu.; handsome cattle with high action, for park driving, chargers, &c., 85 to 120 gu.; thick-set, short-jointed,

sound young horses for town carts, vans, omnibus, hackney and machine work, 35 to 45 g.; of this class of horse there were many herds of Irish horses, and from which selections were made for artillery and other military purposes. Cart-horses, young and sound, for road work, merchants, brewers, &c., 45 to 55 g.; seasoned cart-horses for farming work made low figures; promising cart-colts, 25 to 35 g.; blood stock, young horses of good pedigree, suitable for the field, made 60 to 75 g.; and ditto, accustomed to the hounds, 100 to 130 g.; and horses possessing any of the under-mentioned special qualities—viz., horses of high blood and celebrity, high metal and up to heavy work, good fences, fit for heavy country, &c., realised figures of from 150 to 300 g. and upwards—many Irish horses came within this category of distinction; roadsters, cover hacks, handsome galloways, saddle hacks, &c., made 35 to 45 g.; and horses of full form and fine action, suitable for ladies' riding horses, &c., 65 to 85 g. and upwards; neat, compact, weight-carrying cobs, 25 to 30 g.; and matched pairs for harness and good trotters, 100 g. Brood mares, yearlings, and foals were freely speculated in by breeders; aged cart horses, stall nags, old ponies, &c., sold at reduced figures. The London dealers bought largely, and foreign agents consigned a miscellaneous description of valuable horses to the continent.

IRVINE HORSE FAIR.—Sales were exceedingly dull, horse flesh being at a sad discount. Of first-class horses scarcely any were shown, and there was even an absence of the best of the second class. Prices ranged from £20 to £30, the largest number of those sold ranging nearest to the former figure. Horses rising three years old, of which there were a few in the market, sold from £15 to £20.

KEYNSHAM FAIR.—The supply of stock was fair, but scarcely an average, and the quality was by no means superior. Some good oxen and heifers were, however, offered, but these met a dull sale, at prices ranging from 60s. to 65s. per cwt. For inferior animals there was scarcely any sale, and the prices obtained for them were proportionately low. Of sheep there was a good supply, consisting chiefly of Downs and cross-breeds. One small pen of Shropshire Downs sold at—ewes 43s., and lambs 33s. The supply of wethers was rather short, but those that were brought forward fetched prices averaging from 38s. to 48s. In one or two instances 50s. were asked for Shropshire Downs, and as 48s. only could be obtained, they were removed unsold. Best Downs brought from 38s. to 43s., and cross-breeds from 38s. to 45s. A goodly number of store lambs, in excellent condition, went off at 28s. to 38s.; fat lambs fetched about 9d. per lb. There was about an average supply of store pigs, which brought from 8s. 9d. to 9s. 3d. per score. The horse fair was well supplied, but scarcely any business was done, and most of the cart horses and mares, many of which were in capital condition, remained on hand. The supply of colts was short, especially suckers. Two-year-old animals fetched from £18 to £25 each.

KIGHTON FAIR.—There was a large supply of sheep, particularly of draught ewes, which sold well, the prices realised being from 1s. to 1s. 6d. a head in excess of the values which ruled at the corresponding fair last year. The number of cattle was not large; and, owing to the great scarcity of keep in the grazing districts, store animals were down in price about 20s. a head. There were few butchers' animals, and these realised about recent rates. There was nothing of a first-class character in the horse fair; as to prices, the tendency was decidedly downwards. The trade in the pig department was dull, and prices too arbitrary to be quoted.

LANARK LAMB MARKET.—We quote the prices per score of a few of the lots sold: Mr. John Murray, salesman, Edinburgh, sold Kingledoor black-faced ewe lambs at £17, Huddleshope ditto at £14. Huddleshope black-faced wether lambs £11, Newbishops ditto £11, Kingledoor Cheviot ewe lambs 18s. each, ditto wethers 13s. 3d. each, Cloverhill third ewe lambs 11s. 6d. each, a lot from same district 12s. each. Mr. Paterson of Birthwood's lot sold at £10 10s. Mr. Deane, Glenkirk, sold Cheviot ewe lambs at £12. Eastend black-faced ewes topped the market at £1 12s. 6d. each.

MUIR OF ORD MARKET.—There was a very brisk demand for Cheviot lambs, all of which were sold early in the day. Blackfaced were not so much in demand. There were a good many half-bred lambs, which were all sold. Mr. Gauld, Belladrum, sold a lot of half-bred lambs at 20s.; Mr. Gordon,

Braelangwell, a lot of ditto at 21s.; Mr. Grant, Kinnellan, a lot of ditto at 20s.; Mr. Ross, Torra, a lot of ditto, shot, at 14s. 6d.; Mr. Fraser, Counterisk, sold Cheviot lambs at 11s. 6d., and another lot at 9s.; Mr. Harper, Torgam, a lot of cast ewes at 28s. 6d.; Mr. Trotter, Garguies, a lot of ditto at 26s. 6d. The market was a good selling one for all good cattle, and few croases were left unsold. There was a large number of highlanders, but few were sold when our parcel left. Though prices were good, the market was a stiff one. Mr. Wilson bought a lot of stirks at £12 12s.; Mr. Cameron, Balnakyle, sold a lot of two-year-old fat heifers at £18 15s.; Mr. Forsyth, Arrabella, bought a lot of small cross stots at £1 5s.; Mr. Sim, Ardullie, bought a lot of two-year-old croases at £18; Mr. Campbell, Caithness, several lots of stots at from £7 to £10; Mr. Middleton, Culis, bought a lot of two-year-old stots at £15.

NEWCASTLE (STAFFS) FAIR was tolerably well supplied with stock, bulls in particular being very plentiful. Notwithstanding stock was lower at least 10s. per head, business was unusually dull. Fat stock averaged from 6d. to 6½d. per lb.

NORTHAMPTON FAT STOCK MARKET.—The first sorts of beasts were sold for more money. Pigs in demand, and quite as dear. Sheep sold at late rates.

PITLOCHRY SHEEP AND LAMB MARKET.—The ruling rates were the following: The best blackaced wether lambs sold at prices ranging from £8 10s. to £10 10s. per clad score, and seconds from £5 to £7. The ewe lambs shown were not numerous, and brought rates varying from 9s. to 11s. per head. The lots of crossbred and whitefaced lambs on the ground were also limited, and the demand was pretty brisk. The best lots of crossbreds sold from £13 to £15 10s. per clad score, and inferior lots ranged from £8 to £10 10s. The whitefaced lambs brought from 14s. to 20s. each for the top lots, and seconds sold from 9s. to 12s. per head. The demand for fat sheep was brisk, and prices considerably higher than at the corresponding market last year. Ewes and wethers sold at from £11 to £15 per clad score, and the latter from £18 to £26.

ST. COLUMB MONTHLY MARKET.—There was a good supply of fat bullocks and sheep; the former fetched from £3 to £3 5s. per cwt., and the latter from 6d. to 6½d. per lb. There has not been so good a market here for some time as there was on Tuesday; every sheep was sold, and nearly all the fat bullocks. Cows and calves were not much in demand.

TEWKESBURY FAIR.—There was a good supply of stock, with plenty of buyers. Beef made 6½d. to 7d., mutton 7½d., and lamb 8d. per lb.

TYNDRUM LAMB MARKET.—The best lots of black-faced wether lambs sold from £9 to £11 per clad score, seconds brought from £7 to £8, and shots ranged from £4 to £6 per clad score. The ewe lambs for picked lots sold as high as £12 per clad score, and other lots brought from £9 to £10 10s. per clad score. The top lots of crossbred lambs ranged from £13 to £15 per clad score, and seconds from £10 to £11 10s. per clad score. The half bred and Cheviot lambs sold at rates varying from £13 to £17 per clad score, according to condition.

IRISH FAIRS.—**BALLA:** The following show the average of the prices realized: Bullocks—Mr. Deane sold a lot at £12, Mr. Begley a lot at £15, Lord Oranmore a lot at £15 15s.; and for heifers—Mr. Wm. Gibbons, £9 for a lot; Mr. S. O. MacDermott, £10; Mr. Kirwan, £12; Mr. Crehan, £11 15s.; Mr. G. J. O'Malley, £11 5s.; Mr. Anthony Ormsby, for his second lot, £11 5s.; Mr. Blake, Mr. Tuohy, and several others sold lots, but we did not learn the exact prices. Mr. Larminie sold lambs at 28s.; Mr. P. Tuohy, wethers at £2 10s.; Mr. Wilbraham, a mixed flock of sheep at £1 15s. **ANDER:** Prime beef commanded fully 60s. per cwt., and second-class from 50s. to 52s. 6d. per cwt. Of dairy cows and springers the supply was inconsiderable. The prices were not lower. Good milkers from £12 to £14, and springers £11 to £17 each. In the store cattle department the supply appeared to be below the average, yet it was large enough for the demand, which was rather languid, and many were left unsold in the evening. Three-year-old heifers were worth £11 to £13 10s. in the range, two-year-olds from £8 to £9 10s.; and yearlings from £4 to £6; weanling calves, 35s. to 45s. each; young bullocks were

in fair request at £6 to £9 each. The sheep fair was exceedingly well supplied, including a large show of excellent lambs. Weather mutton maintained stiff prices, and may be quoted at fully 7d. per lb.; ewe mutton at 6d. Lambs ranged from 22s. to 32s. each, and met a ready sale throughout for the English markets. The pig fair was poorly supplied with large, heavy-meat animals, nor, indeed, was there apparently any great demand for them, and the pig jobbers who usually trade with England in the bacon-curing season were, for the most part, seen purchasing lambs. Bacon pigs and porkers might be quoted at an average of 44s. to 45s. per cwt. Store pigs and slips met a fair, active demand at remunerative prices. Much animation prevailed the weanling department, and brisk buying took place, as feeding is getting plentiful. Suckers and weanlings sold from 10s. to 16s. and 17s. 6d. each. Several nags were disposed of at prices varying from £12 to £18.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, August 24.—Our trade is active, not sufficient rain having fallen to revive the pastures.

Dorset, fine	112s. to 114s. per cwt.
" Middling	90s. to 100s.
Devon	102s. to 106s.
Fresh	13s. to 14s. per dos. lbs.

CARMARTHEN BUTTER EXCHANGE, (Saturday last).—A large supply of Butter to market this day, and demand quite equal to it. The whole was bought up freely at 86s., and the choice dairies at 88s. Market very firm at the quotations.

CORK BUTTER EXCHANGE, (Saturday last).—The receipts this week averaged 2,000 firkins daily, about three-fourths of which was second quality. Owing to the inquiry for Cork Butter in London, the demand here has been brisk, with a rising tendency, despite the large supplies. Since Monday firsts rose from 96s. to 97s., seconds from 90s. to 92s., thirds from 77s. to 79s., fourths from 68s. to 70s., and fifths from 52s. to 53s. The supply of mild cured Butter averaged 200 firkins a day. It now quotes 99s., 94s., and 81s. for firsts, seconds, and thirds, being a slight advance on the week.

BRIDGNORTH FAIR. — A quantity of good family cheese fetched 4d. per lb.

CHIPPENHAM.—A full market: over 200 tons of cheese were pitched, but the trade was very dull. We may fairly quote a fall in price, of from 8s. to 4s. per cwt., on the average quantity, although the cheese came to hand (considering the warm weather) in good condition. Broad doubles 58s. to 63s., prime Cheddar 60s. to 70s., leaves 60s. to 68s., thin 46s. to 50s., skim 24s. to 30s. per cwt.

GLOUCESTER.—About 100 tons of cheese. Buyers were numerous, and a good clearance was effected early at the rates prevailing at last fair. The quotations were: Best singles 52s. to 56s., seconds 42s. to 48s., skims 20s. to 30s.

MORETON-IN-MARSH FAIR. — About 10 tons of cheese were pitched, and sold from 35s. to 65s. per cwt.

HOP MARKET.

BOROUGH, MONDAY, Aug. 24.—Our market shows no alteration since the date of our last report, prices being firm, and the trade restricted to orders for immediate consumption. There have been several pockets of the new growth to this market; but picking will not be general for ten days to come. Mould is still on the increase in Mid-Kent and some other districts; but the plant has been generally improved by the late rains. Currency as before.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, August 24.—The supply of home-grown Potatoes on sale is seasonably large. Nearly all qualities are in fair average request, and prices are well supported. The show of foreign produce is very small.

Kent and Essex Regents	per ton 80s. to 110s.
" Shaws	60s. to 80s.

COUNTRY POTATO MARKETS.—DOWCASTER, (Saturday last).—A good supply of potatoes, which met a fair demand at the following prices: wholesale 7s. to 8s. per 18

stone, retail 8d. to 10d. per peck. MANCHESTER, (Saturday last).—Potatoes 6s. to 11s. per 252lbs. YORK, (Saturday last).—The supply at market weekly becomes more plentiful, and there is consequently a corresponding and gradual reduction in price. Rounds to-day sold at from 7d. to 8d. per score wholesale, and the same prices per peck retail. Kidneys were 9d. to 10d. per score, and about the same rates per peck.

WOOL MARKETS.

ENGLISH WOOL MARKET.

CITY, MONDAY, Aug. 24.—Since our last report a fair average business has been passing in most kinds of home-grown wools, and the quotations have been well supported. The supply on offer is seasonably good. There are still a few orders in the market on continental account.

CURRENT PRICES OF WOOL.

ENGLISH (per lb.)			
s. d.	s. d.	s. d.	s. d.
Middle hoggets 1 10½ to 1 11½	Combing skins 1 5½ to 1 7		
Ditto wethers.. 1 8½ 1 9½	Carding ditto.. 1 3 1 5		
Hf.-bred hoggs. 1 9 1 10½	Head ditto.... 0 10 1 1		
Down tugs.... 1 8 1 9	Nells	1 1 1 3	
Down ewes.... 1 7 1 8½	Brokes	1 1 1 3	
SCOTCH (per 91lb.)			
s. d.	s. d.	s. d.	s. d.
Laid Highland 17 0 to 18 0	Laid Cheviot.. 20 0 to 30 0		
White ditto .. 19 0 21 0	Laid Cross.... 18 0 21 0		
White Cheviot, 34s. to 42s.			

BRADFORD WOOL MARKET, (Thursday last).—There is a considerable improvement in the tone of our markets this week. The spinners having received some considerable orders are operating much more freely, and greater confidence is exhibited in all branches of the trade. This state of things, of course, strengthens prices. Staplers, who could with difficulty obtain their prices last week, are now standing out for an advance of ½d. to 1d. per lb. on most sorts, especially on Lincolns. Where they are willing to accept last week's quotations sales are readily effected, and for considerable quantities. This improvement is doubtless traceable to the prospect of a good harvest, and to the healthy state of trade generally.

GLASGOW WOOL MARKET, (Saturday last).—During the past week prices have remained quite unchanged, and considerable quantities of different sorts have been sold. Consumption is going on rapidly, and buyers appear more willing to give the prices asked. Blackfaced wool are in steady demand, and, as usual at this season, the best clips are most easily sold, at full rates. Laid Cheviots are wanted, and stocks even at present are becoming very much reduced. White wools are in fair request.—F. H. M'LEOD.

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS, Friday.—There is a fair demand for most kinds of English wool, and prices are maintained with great firmness, because it is impossible to replace stocks at lower prices from the country. Colonial wool is unaltered in price, and the sales which are just terminating have shown great uniformity throughout their continuance. There is a steady demand from the manufacturers.

LIVERPOOL WOOL MARKET.—AUGUST 22.

SCOTCH.—There continues to be very little doing in any kind, manufacturers and spinners having supplied themselves for the present, and the high prices make people act with great caution.

	s. d.	s. d.
Laid Highland Wool per 94lbs.	17 6 to 19 0	
White Highland do.	21 0 21 0	
Laid cross do. ..unwashed....	20 0 21 0	
Do. do. ..washed.....	21 0 22 0	
Laid Cheviot do. ..unwashed....	23 0 25 0	
Do. do. ..washed.....	25 0 21 0	
White Cheviot do. ..washed.....	33 0 44 0	

FOREIGN.—As is usual so soon after the public sales, parties having supplied themselves, there has been little doing this week, but stocks of useful Wools are small, and holders are sanguine.

WOOL.—FRANCE.—At the Soissons fair the wool brought forward was almost all sold—that in an ordinary dirty state at 1s. 9d. per kilogramme (the fiftieth part of a cwt.), while washed wools made 3s. 10d. to 4s. 3d. per kilogramme. Lambs' wool did not find purchasers. At Marseilles prices have remained firm. Washed Crimean made 1s. 8d. to 1s. 8½d., and Mowool 2s. 7½d. per kilogramme.

THE METEOROLOGY OF AUGUST.

The fine weather which distinguished the month of July happily continued far into the month of August, and enabled one of the finest harvests that has been known for many years safely to be gathered; indeed, from the 26th July to the 16th August, a period of twenty-two days, rain fell on two days only, namely the 4th and 6th of August, and the total amount collected on those days was insignificant, amounting only to 0.19 inch. But it will be necessary to recapitulate (after the manner followed in preceding months) the individual characteristics of each day or group of days, which are briefly as follows:

The 28th and 29th July were cloudy and generally warm, and their mean temperatures exceeded the average values by the amounts of 0.1° and 1.2° . On the 29th, the wind changed to N.E., and blew generally from the east during the following three days, and the weather became much colder, the mean deficiency of temperature for those days amounting to 3° . The mean temperature on the 31st was nearly 6° below its average value, the temperature during the early morning hours falling to 44° , and not rising beyond $69\frac{1}{2}^{\circ}$ throughout the day.

On the 2nd August the wind settled in the south-west, and a warm period set in, which continued for fifteen days, viz., from the 2nd to the 16th August. The greatest amounts of excess of mean temperature above corresponding average values were 7° on the 10th, $6\frac{1}{2}^{\circ}$ on the 7th and 8th, $5\frac{1}{2}^{\circ}$ on the 9th, 5° on the 15th, and almost 5° on the 11th and 16th, the remaining days of the period being in excess by values less than 2° in amount. High temperatures were occasionally attained during these days, of which may be instanced 85° on the 9th, 83° on the 3rd and 10th, 81° on the 2nd and 15th, and 80° on the 7th and 8th; but the daily ranges of temperature were not particularly large, in consequence of the nights being also warm; the greatest ranges were $28\frac{1}{2}^{\circ}$, which occurred on the 9th, and 27° (about) on the 2nd, 3rd, 13th, and 15th. On the morning of the 2nd distant thunder was heard and lightning seen, but the storm itself passed some distance to the north of this neighbourhood; on the 4th and 6th rain fell to the several amounts of 0.06 in. and 0.13 in.

The wind continued in the south-west from the 2nd to the 12th; then a change to easterly currents took place, continued for three days in this quarter, and was then replaced by south-west. The change to easterly winds induced a greater degree of dryness in the atmosphere than had before prevailed; and we consequently find that from the 11th to the 17th the degree of humidity varied between 62 and 69. From the 17th to the 19th the barometric column was constantly varying, and the weather was very unsettled during those days, rain at times falling heavily, and to the collective

amount during the three days of 0.29 in. They were also somewhat cold, a state of things especially noticeable, following so closely upon the recent warm period. Thus, on the 18th, the mean temperature of the day fell below its average value to the amount of $4\frac{1}{2}^{\circ}$, and on the 19th to the greater amount of $7\frac{1}{2}^{\circ}$. On the 21st the barometer reached a maximum reading of 30 inches, and then declined slowly during the following three days. From the 20th to 24th a generally fine period prevailed, although cold and cloudy, and the mean temperatures fell below their respective averages by $5\frac{1}{2}^{\circ}$ on the 20th, $4\frac{1}{2}^{\circ}$ on the 21st, and by nearly 1° on the 22nd and 24th; the temperature on the 23rd, however, was exceptional, for it exceeded its average by $3\frac{1}{2}^{\circ}$.

On the 25th the barometer fell rapidly to the low reading 29.30 inches, and during the following two days the readings ranged between 29.38 and 29.21 inches; the latter reading, which was the maximum for the month, having been reached on the morning of the 27th. The weather was very unsettled on these days, and rain occasionally fell with a great degree of heaviness, especially on the 25th, on the evening of which day a very severe thunder storm occurred, during the progress of which a church in this neighbourhood was struck by lightning. The amount of rain collected for the 26th amounted to 0.40 inch, and was followed by falls on the 26th and 27th to the amounts of 0.34 and 0.39 inch; making a total fall for the three days of 0.93 inch.

On examining the tables of results, we find that the highest barometer reading occurred on July 31st, and was 30.14 inches; the lowest was 29.21 inches, on the 27th August, giving a range for the month of 0.93 inch. The highest temperature in the shade was 84.9° on the 9th; and the lowest was 44.1° on the 31st of July, making a range of temperature of 40.8° . The highest reading of a thermometer placed in the full rays of the sun was 120° on the 28th of July, and the lowest on the grass was 34° on the 31st of July. The dampest day in the month was the 26th of August; the driest day was the 12th. The total amount of rain collected during the month amounted to 1.44 inches, or about 1 inch less than the average value for the month of August. The days on which rain fell were about the average, amounting to ten in number. The past month, therefore, appears to have been all that could be desired for farming purposes, fine for a sufficient length of time to enable harvesting to proceed to a satisfactory conclusion; then, towards its end, damp and rainy, yet not too soon for roots, which would undoubtedly have suffered had drought longer continued. On the whole, therefore, we may consider that we have been favoured with the finest harvest season that has happened for many years.

METEOROLOGICAL ELEMENTS FOR THE NEIGHBOURHOOD OF LONDON;

FROM JULY 28TH TO AUGUST 27TH, 1863.

Month and Day.	Temperature of the Air in Shade.			Highest Reading of a Thermometer in the full Rays of the Sun.	Temperature of Vegetation.*	Degree of Humidity. (Saturation=100).	Amount of Cloud, 6 to 10.	Amount of Rain. Inches.	General Direction of the Wind.	Weather Remarks.
	Highest	Lowest	Mean.							
1863.	°	°	°	°	°					
July 28	78.0	47.2	62.6	120.0	40.0	75	2.5	0.00	S., S.W.	Generally clear; fine
29	77.4	50.5	63.7	106.0	40.0	78	7.3	0.00	calm, N.E.	Partially cloudy
30	73.1	52.4	61.3	114.0	47.0	69	1.3	0.00	N.E.	Generally clear; fine day
31	69.6	44.1	56.7	115.0	34.0	77	2.0	0.00	N., S.E.	Very fine; few clouds
Aug. 1	73.3	48.3	60.4	110.0	41.5	75	5.5	0.00	S.E., E.	Light clouds prevailed
2	80.8	54.1	64.8	115.5	44.3	79	7.0	0.00	S., S.W.	Cloudy; thunderstorm
3	82.9	55.7	64.1	99.3	47.9	79	8.5	0.00	S.W.	Cloudy
4	75.8	54.7	64.2	111.7	41.2	81	8.5	0.06	S.W.	Cloudy mostly; rain evng.
5	74.3	56.2	62.6	94.0	51.9	79	5.8	0.00	S.W.	Overcast morn.; few clouds
6	72.5	57.7	62.4	99.0	52.2	85	10.0	0.13	S.W.	Overcast, rain morning
7	80.0	60.8	68.6	111.0	54.0	82	8.0	0.00	S.W.	Generally cloudy
8	80.0	62.7	68.4	113.0	57.5	79	6.5	0.00	S.W.	Cloudy morn.; few clouds
9	84.9	56.3	67.6	115.2	47.0	83	3.7	0.00	S.W.	Fine; few clouds
10	83.2	60.0	68.8	117.7	51.5	75	4.8	0.00	S.W.	Fine; partially cloudy
11	79.0	57.5	66.3	117.0	48.4	63	6.5	0.00	S.W., N.	Partially cloudy
12	75.1	50.1	61.9	117.0	41.3	62	4.5	0.00	N.E.	Cloudy morn.; clear night
13	77.9	50.9	63.4	115.0	41.5	69	7.3	0.00	S.E., N.W.	Cloudy, especially at night
14	73.1	55.5	63.2	109.5	46.2	69	6.0	0.00	N.E., S.W.	Cloudy till evng.; then clear
15	81.0	53.7	66.4	116.2	49.8	67	4.5	0.00	S.W.	Few light clouds
16	76.0	58.5	65.2	115.0	50.0	65	7.7	0.00	S.W.	Generally cloudy
17	74.0	52.1	59.6	112.8	47.1	65	6.0	0.10	S.W., W.	Cloudy; rain after noon
18	65.8	49.2	56.5	98.0	47.5	71	9.0	0.02	W., N.W.	Rainy morning; overcast
19	62.0	51.3	53.6	83.3	42.5	84	8.5	0.17	W., S.W.	Cloudy, with heavy rains
20	63.3	50.5	55.3	92.8	44.5	70	5.8	0.01	N., N.W.	Partially cloudy; clear night
21	66.0	46.0	55.8	90.2	37.2	70	8.3	0.00	N., N.W.	Fine morning; cloudy night
22	71.2	50.1	59.5	101.0	42.3	89	7.3	0.00	N., W.W.	Partially cloudy; fine
23	74.6	55.9	63.7	111.5	46.8	68	9.0	0.02	S.W.	Cloudy; fine; a little rain
24	72.9	53.5	59.5	106.0	48.0	72	7.5	0.00	S.W.	Cloudy day; clear night
25	70.0	49.8	59.9	108.0	42.6	73	9.5	0.40	S.S.W.	Overcast; thunderstorm
26	64.2	51.1	57.1	94.0	43.0	90	10.0	0.24	S.W., S.	Overcast; rain
27	69.2	55.4	60.4	97.0	53.2	84	8.3	0.29	S.S.W.	Partially cloudy; rain

* The "temperature of vegetation" is that obtained from a self-registering minimum thermometer placed on the grass at night. It is therefore a minimum reading for the twenty-four hours preceding the time at which the thermometer is read.

TABLE SHOWING THE PRINCIPAL FLUCTUATIONS IN THE ATMOSPHERIC WAVE, FROM JULY 28TH TO AUGUST 27TH, 1863.

1863. Month, Day, and Hour.	Reading of Barometer.*		1863. Month, Day, and Hour.	Reading of Barometer.*	
	Highest.	Lowest.		Highest.	Lowest.
	Inches.	Inches.		Inches.	Inches.
July 28, 9 p.m. ..		29.86	Aug. 15, noon		29.66
" 31, 9 a.m. ..	30.14		" 15, 9 p.m. ..	29.72	
Aug. 5, 9 a.m. ..		29.71	" 17, noon		29.55
" 8, 9 a.m. ..	29.98		" 19, 9 a.m. ..	29.77	
" 8, 9 p.m. ..		29.93	" 19, 9 p.m. ..		29.60
" 9, 9 a.m. ..	30.00		" 21, 9 a.m. ..	30.02	
" 11, 9 a.m. ..		29.85	" 25, 9 p.m. ..		29.30
" 12, 9 a.m. ..	29.94		" 26, 9 a.m. ..	29.38	
" 13, noon ..		29.76	" 27, 5 a.m. ..		29.21
" 14, 9 a.m. ..	29.89				

* All the readings are reduced to the constant temperature of 32 degs.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

August, like its immediate predecessor, was, on the whole, a dry and brilliant month, though with many changes of temperature, much wind, occasionally light showers, and some heavy rain at last. Harvest work has, therefore, had very little interruption from its commencement, and as considerable progress has been made in the southern and midland counties, we are in a better position to estimate its probable result. The point upon which nearly all are now agreed is, that we have an unusually fine and abundant crop of wheat, 64lbs. per bushel being a common weight, and simply on this view of the question we have a gain upon the average of about one million quarters in weight, while in nutriment there is probably another million more; but we cannot stop here, for the acreable increase is very much beyond that. Were the accounts of local abundance taken as a standard for the country, our produce would seem to be double the ordinary yield; and perhaps it may not be an exaggerated estimate to take the increase at 50 per cent., a supposition which, if eventually substantiated, calls for special gratitude to the Giver of all good. With regard to other cereals there is more diversity and less certainty. The barley was stunted by drought. Oats very various, some remarkably heavy and some light. Peas doubtful, and beans deficient; but the condition of all unusually good. Ireland, without a heavy crop of corn, is better off than for years past, and equally so in the quality of her potatoes, and their general freedom from disease. Scotland seems fully up to, if not beyond the average. But hay throughout the kingdom, and we may add throughout the world, seems very short. Wheat, too, is not only abundant here, but well spoken of in Germany, France, Italy, and some parts of Russia, and most of the United States; but Indian Corn has far less promise, both in the old world and the new. Such a harvest, gathered so early, could not be without a telling effect upon prices; and though the first samples were caught up from their fine quality at full rates, their appearance in quantity soon brought a change, and threw the little old still offering into absolute neglect; while holders of foreign have for the present found sales very difficult to effect, even on much lower terms. Indeed, prices have become quite uncertain. Almost every country shows a lower range; but a perfect panic has obtained at Danzig, with offers of samples at fully 5s. per qr. less. Fine new English white, which opened at 44s. to 58s., has since become a slow sale at 45s. to 47s. Of course there is now no foreign port where prices have been shaped to the present state of the English markets; but we give some recent quotations, not doubting that a post or two will make a material change, but not enough to give a chance of profitable business. The averages this month as yet show no difference. The foreign

imports for the kingdom in four weeks were 556,750 qrs. wheat and 543,679 cwt. flour. The top price of wheat quoted in Paris was 47s. to 48s., Baltic wheat at Antwerp 49s. 6d., American 47s. 6d.; new native wheat at Maestricht 47s. 6d. per qr.; new at Straubing, 42s. 6d.; old at Danzig uncertain, say 46s. per qr.; at Odessa 41s.; Wahren at Hambro 49s.; Saida at Alexandria 29s.; native at Venice 45s.; Banat Wheat at Trieste 43s.; the best soft at Algiers 45s. 6d.; white wheat at Montreal, 35s. 4d. per qr., red 34s. 2d. Spring wheat at Milwaukee 25s. 6d. per qr.; at Chicago, 25s. 3d. The quality of this year's wheat in the United States, is said on the whole, to be quite an average, but the yield less, more especially of winter red. White Michigan about 35s. per qr., red Western 32s. 6d., Milwaukee 31s. 6d., Chicago 30s. 4d., at present exchange. The best wheat at Melbourne was worth about 54s. per qr.

The first Monday commenced on moderate supplies, both of home-growth and from abroad. The morning's show from the near counties was very small and mostly old; but a few samples of the new crop were among the rest. Some was hastily got up, and injured in condition; but what was dry was of fair quality, and fine Talavera brought 58s.; but the prices then paid were not reliable, there being so small a quantity on offer. Old found a slow sale at the previous currency; and the few sales made of foreign were at unaltered values. Floating cargoes were much less in request, and sold with difficulty at 1s. per qr. reduction. Farmers being very busy this week with the commencement of harvest, very short supplies were generally brought to market, but the attendance of millers was in the same ratio, with prices mostly about the same, though Boston and some places were 1s. per qr. lower. Liverpool was down 1d. to 2d. per cental for wheat on Tuesday, but there was no subsequent change. The prices at Edinburgh were as before, but Glasgow was lower 1s. per qr. on American red. In Ireland business was inactive, with prices unvaried.

The second Monday had about the same moderate English supply, but there was a heavy arrival from abroad, about three-fourths being from America. This was the first real market for new wheat, which appeared in quantity, say over 3,000 qrs. The bulk was very good and heavy, though some came to hand badly from being caught by the weather. The prices realised did not show the usual difference of value, varying from 48s. to 52s. Old was neglected at 1s. per qr. reduction, and foreign was quite as much lower, with very little doing. There was, however, no decline in floating cargoes. The further proceeding with harvest in most suitable weather again made all markets throughout the country. Some places, from the small quantity showing, realised former prices, but more generally, where business was doing, 1s.

per qr. decline was accepted. Liverpool was down again on Tuesday 1d. to 2d. per cental on wheat, and Friday's market was 1d. per cental further reduced. Edinburgh was dull this week, and Glasgow noted a further fall of 1s. per qr. Ireland was duller than previously, very few millers coming to the market.

On the third Monday there was an improved English, but only moderate foreign supply. This morning's show from Kent and Essex was rather more liberal than that of the previous week, and the quality and condition still better. The small portion of red appearing averaged about 64 lbs. per bushel, but would only sell by an acceptance of 2s. per qr. below the previous rates. White was dull at 3s. to 4s. abatement on the prices of that day se'nnight. Foreign was a very slow sale at 1s. to 2s. per qr. reduction, and cargoes afloat declined 1s. per qr. This was a very irregular week in the country; some markets only exhibited old samples in small quantities, but at many there was a fair exhibition of new; and all these places noted a decline, excepting where new samples were shown for the first time. The London advices had a great influence, and an average reduction of 2s. to 3s. obtained; some places, as Market Rasen, being down 3s. to 4s. per qr. The Liverpool decline was about 2d. per cental. In Scotland, with but little new wheat showing, the markets for old were dull and cheaper. At Dublin wheat was 6d. per brl. cheaper, with the markets generally tending downwards.

The fourth Monday opened on fair English and heavy foreign supplies, nearly half being from New York and Montreal. There was a good supply of new wheat this morning from the near counties, though very little old. A few picked samples of red went off early from the Kentish stands at about the previous rates, but as the day wore it became necessary to accept a reduction of 1s. to 2s. per qr. on white, and about 1s. per qr. on red qualities, a like decline being taken on good old; inferior was quite neglected. The foreign trade was on so small a scale that it was difficult to quote prices; a few retail sales were, however, made at about 1s. per qr. decline on the previous rates; cargoes afloat being as much lower, with but a languid enquiry.

The imports into London for the four weeks were 22,008 qrs. English, 108,103 qrs. foreign, against 10,057 qrs. English, 108,954 qrs. foreign for the same period in 1862, making the late deliveries of English double what they were.

With fine harvest weather ruling throughout the month, and some of the new wheat made into flour of very satisfactory quality, it was not to be expected that the flour trade should be anything but dull. The principal alteration has been in the value of town-made, the top price of which was lowered from 47s. to 43s. on the 17th ult., no change having taken place since last November. Country-made samples have, however, only given way 1s. per sack, and American barrels 1s. per barrel. Most of the latter receipts have been of but poor quality, and not worth over from 21s. to 22s. per barrel, though some fine might bring 26s. The imports during the four weeks into London

were 42,062 sacks country, 496 sacks 108,478 barrels foreign; against 40,185 sacks country, 4,189 sacks 68,842 barrels foreign in 1862.

The barley trade, as is usual at this period, has been on a small scale. The little new that has hitherto appeared has not been very fine, but when malting sorts come into demand better may be expected. Grinding foreign has gone off in retail with very little change of value through the month, being worth from 26s. to 29s. per qr.: the low price of oats and Indian corn has somewhat limited the enquiry, and prices at the month's close were rather looking down. The imports into London for four weeks were, 1,685 qrs. English, 19,786 qrs. foreign; against 1,410 qrs. English, 22,517 qrs. foreign for the same time last year.

The malt trade has been in calm all through the month, but fine qualities have fully maintained their previous value.

The supply of foreign oats has been continuously free, and with some English new of fine quality appearing, notwithstanding the low prices with which the month commenced, there has been a further decline of 1s. per qr. This reduction has brought heavy losses to importers, and we hardly think prices can descend lower, as the new corn will not be so fit for use as the old, notwithstanding its generally good condition. Useful Russian sorts have lately been procurable at from 17s. 6d. to 21s. per qr., and good Swedes at 20s. per qr. It must be remembered, too, that we have a light crop of hay and scarcely any grass. Any falling off, therefore, in foreign supplies would be pretty certain to produce some reaction. The imports into London for four weeks were in English qualities 3,869 qrs., Scotch 1,348 qrs., Irish 3,300 qrs., and 146,254 qrs. foreign; against 6,347 qrs. English, 261 qrs. Scotch, 912 qrs. Irish, 169,983 qrs. foreign in 1862.

Beans have been very steady all through the month, the crop not being expected to turn out abundant, whatever may be its condition. At Alexandria quotations were 26s. 6d. per qr., and mazagans at Algiers were the same. In London the same qualities were worth 32s., with firmness on the part of holders. The consumption, however, at this period of the year being limited, no material advance can be immediately expected. The imports into London for four weeks were as follows: Home produce 2,217 qrs., foreign 5,173 qrs.; against 2,081 qrs. English, and 9,204 qrs. foreign for the same time last year, showing a present deficiency of 3,895 qrs.

Very little has been doing in peas. The new samples brought to market have been of fair quality, but the yield is not considered large, and on light soils it is very deficient. There being no demand for boilers, few have been sent to market. The consumption of old white foreign for feeding purposes has been interfered with by the low price of oats and other corn. The new hog feed have realised 37s., and maples may be worth more, but it is doubtful if they much exceed these rates. White boilers have as yet no settled value, and unless they recover favour are not likely to be high-priced. The imports into London for the four weeks were, 1,941 qrs. English, 10,483 qrs. for-

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5 H. 10

How the Farmer's Family

London: Published by W. G. and J. Smith, 10, Strand, 1840.

A. Cooper, R.A.

THE BRITISH FARMER'S MAGAZINE. NEW SERIES.

VOL. XLIV.

1863.

NO. CIX.

PLATE I.

A COTSWOLD RAM.

THE PROPERTY OF MR. WILLIAM LANE, OF BROADFIELD FARM, NORTHLEACH.

At the great Battersea meeting, as we then wrote, "the Cotswold hillmen furnished *the* feature of the sheep show with an entry of ninety strong. The old rams were an admirable lot, and Mr. Lane's first ram perhaps at all points the best sheep of the show." He was certainly considered by many breeders the finest Cotswold ever exhibited, and, with such a character, was well worthy of being portrayed as a sample of his sort. Standing famously on his forelegs, and with a wonderfully straight and wide back, a good head, and of a very superior quality, he easily separated himself from all the Garnes, Mr. Handy, and others could achieve in a very good class of old rams. Still Mr. Lane

never entered this sheep but on that special occasion, although many of his relatives, half-brothers and sisters and so on, have been prize-takers at the Royal meetings, the only gatherings at which Mr. Lane exhibits, and where, within the last twelve years, he has gained close upon forty premiums. The Broadfield flock is, in fact, the most successful of any on the Cotswolds; and deservedly so, too, having been very carefully cultivated by the owner, who never shows any sheep but of his own breed, and all these what are termed thoroughbred Cotswolds. It may be a point of some interest to add that the best Battersea ram was a twin sheep.

PLATE II.

THE FISHERMAN'S FAMILY.

Mr. Cooper traces the home of his sweet sketch to the shores of Loch Ness, of which, Mr. Stoddart says its salmon fisheries are not remarkable for their productiveness, but that both salmon and sea trout are taken with the rod from the side. He has caught sea trout in its waters from three to one-and-a-half pounds, with a number of large yellow

trout, some upwards of two pounds, all in one day's work. But the loch is much raked by the lath or "otter," a means to an end that the owner of the grey garron might possibly be able to enlighten us on. His "plant," however, group very charmingly together, and there is a Scotch air and tone about the scene quite bracing to look upon.

METROPOLITAN SEWAGE.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

The Metropolitan Board of Works have now under their consideration various plans for the utilization of the sewage of the Metropolis. After long and very wordy debates, a committee of the Board was some time since appointed. To that committee the various plans of different sewage schemes were referred; and upon those the committee have recently made a report. In this the various plans are described, and upon that report the Metropolitan Board will speedily have to sit in judgment. It is, indeed, time that the reign of verbiage in this matter should cease, and decided action be adopted. It is of the very utmost importance that no error should occur, in the selection of a plan. If the right system is adopted, its success will be a guide to other densely-populated towns: its failure will do incalculable injury to the progress of sanitary efforts, and to the use of sewage in agriculture.

It may be taken that the Commissioners clearly understand as truths—1st, That the only practical method of sewage purification is by the irrigation of grass land; 2ndly, That it can only be profitably so employed in large quantities, such as from 8,000 to 6,000 tons per acre annually; 3rdly, That all filtration of sewage is practically exceedingly difficult, if not impossible; 4thly, That the matters mechanically suspended in sewage, which is the portion separated by the filter, is of little agricultural value; 5thly, That the portion chemically combined with the water of sewage is the most valuable, but that this passes through the filter.

The opponents of sewage irrigation very naturally produce every kind of objection, real or imaginary, to its adoption. Let us examine one or two of these. 1st, then, it is urged that sewage-irrigated grass contains more water than unsewaged. This very question was not long since examined by the Royal Commissioners during their Rugby experiments. They found (*Jour. Roy. Ag. Soc.*, vol. xxiii., p. 81) that the amount of dry substance in two groups of plots, of four plots each, in the first crop of sewage grass was greater than in the unsewaged; but in the second crop it was less. The mean per-cent. of dry substance in fresh grass they obtained were as follows:—

Five-acre Field.	First Crop.	Second Crop.	Third Crop.	Fourth Crop.
1 (Unsewaged)	27.9	24.4	...	...
2 (Sewaged)...	30.5	19.8	18.4	...
3 (Sewaged)...	26.9	14.2	18.7	15.4
4 (Sewaged)...	27.7	13.7	13.9	9.6
Ten-acre Field.				
1 (Unsewaged)	22.0	26.9	...	...
2 (Sewaged)...	23.3	17.1	13.6	16.9
3 (Sewaged)...	21.4	15.1	7.8	15.1
4 (Sewaged)...	18.4	16.1	14.4	17.8

2ndly, The opponents of this kind of irrigation have urged that the milk of cows fed off the sewage grass would be poorer than when fed on unsewaged grass. The

milk of cows fed in both ways was therefore examined by the Commissioners. They found that the mean composition of 100 parts of milk from cows fed with both kinds of grass was as given in the following table:—

	Cows fed on Grass and Oilcake.		Cows fed on Sewaged Rye-grass and Clover, and Oilcake; 1 Sample.	
	Unsewaged; Mean of 4 Samples.	Sewaged; Mean of 4 Samples.	Unsewaged; Mean of 10 Samples.	Sewaged; Mean of 10 Samples.
Casein	3.246	3.352	3.241	3.125
Butter	3.604	3.657	3.480	3.473
Sugar of milk, &c.	4.405	4.551	4.318	4.700
Mineral matter...	0.753	0.740	0.776	0.752
Total solid matter...	12.003	12.310	11.665	12.050
Water	87.992	87.690	88.335	87.950
	100.000	100.000	100.000	100.000

So that, as Mr. J. B. Lawes remarks (*ibid.*, p. 84)—“There is apparently but little difference between the average composition of the milk yielded from the unsewaged and the sewage grass, whether they be respectively consumed alone, or in conjunction with oilcake. That from the sewage and more succulent grass is slightly more aqueous, and contains slightly less of the organic constituents—casein, butter, and sugar of milk—and slightly more of mineral matter, during the early part of the season, when the cows had grass alone; but these relations are reversed during the four weeks when oilcake was given in addition. The addition of the oilcake, both in the case of the unsewaged and of the sewage grass, but particularly in that of the latter, notably increased the proportion of the three organic constituents, and of the total solid matter of the milk, but somewhat diminished that of the mineral matter. Again, comparing the figures in the second and the fifth columns, those in the latter giving the composition of the milk when, for a few days

only during the progress of the experiment, the diet of the cows was changed from sewage grass alone to sewage Italian ryegrass and clover, with oilcake in addition, the influence of the oilcake is seen to be of the same kind as already alluded to—increasing generally the proportion of the organic constituents, and of the total solid matter of the milk, and diminishing somewhat that of the mineral matter.

"The results of the first season's experiments at Rugby may be briefly enumerated as follows:—

"1. By the application of large quantities of dilute town sewage to permanent meadow land during the spring and summer months, there was obtained an average increase of about 4 tons of green grass (which, owing to the lower proportion of dry substance in the sewage grass, was equal to only about three-fourths of a ton of hay) for each 1,000 tons of sewage applied, until the amount of the latter approached the rate of about 9,000 tons per acre per annum. The largest produce obtained was about 33 tons of green grass per acre. The period of the year when an abundance of green food was available was, with the largest amount of sewage, between five and six months.

"2. Oxen tied up under cover, and fed on cut green grass alone, whether sewage or unsewaged, gave a far lower rate of increase than the average attained by animals fed on ordinary good fattening food; but when for a few weeks oilcake was given in addition to the grass, they yielded a good average rate of increase.

"3. Cows tied up under cover, and fed on cut green grass alone, after previously receiving oilcake, fell off considerably in their yield of milk, and about equally whether the grass were sewage or unsewaged. The cows on unsewaged grass consumed more food, and gave more milk, in relation to their weight, than those on sewage grass; but the amount of milk yielded for a given amount of fresh food consumed was almost identical in the two cases; though, in proportion to the dry or solid matter which the food contained, the sewage grass yielded considerably more milk than the unsewaged. Milk to the gross value of £32 per acre was obtained where the largest quantity of sewage was applied. The gross value of the milk from the increased produce of each 1,000 tons of sewage was between £5 and £6.

"4. The composition of the Rugby sewage-water varied very much during the course of the season, being much more concentrated during the drier months. On the average, over about seven months, 1,000 tons of sewage contained about 21½ cwts., or little more than one ton of solid matter; about 212lbs. of ammonia, or about as much as is contained in 11 cwts. of Peruvian guano; and probably represented the excrements of twenty-one or twenty-two individuals of a mixed population of both sexes and all ages for a year. This average composition agrees very closely with that which published analyses indicate for the sewage of London.

"5. On the average the sewage grass contained, as cut, a considerably lower proportion of dry or solid substance than the unsewaged; but the dry substance of the sewage grass generally contained a higher proportion of nitrogenous compounds.

"6. Analysis shows very little difference in the quality of the milk yielded respectively from sewage and unsewaged grass. The difference in composition, such as it is, is slightly in favour of the milk from the unsewaged grass when grass was given alone, and slightly in favour of the sewage grass when oilcake was given in addition."

To return to the various schemes for employing the metropolitan sewage, a digest of these proposals has been well given by the editor of the *Agricultural Gazette*, a *résumé* which I need hardly attempt to put in other words.

1. The first plan is by Dr. Thudichum, M.D., who proposes, by a mechanical arrangement, so to separate the house drainage as to retain that which he considers most valuable, and gives a sketch of his closet and drains, and tables of analysis of the constituents of fluid sewage. He estimated the cost of the works for carrying out his process at £1,500,000, and the net profit at £1,000,000 per annum; of this he proposes that he should receive a percentage, and that one-half of the balance should be paid to the Board, and one-half to the shareholders of a company formed for carrying out the system.

I should hardly incline to believe that by any mechanical arrangement the object in view can be obtained. The portion of sewage separated by a filter, as I have already remarked, is the least valuable as a fertiliser; and the same observation applies to the plan of Mr. Kirkman.

2. Lord Torrington, Sir C. Fox, and Mr. Thornton Hunt regret their inability to comply with the conditions of the advertisement, on the ground of the impolicy of publicly declaring the land with which they propose to deal, but express their willingness to discuss the matter with the Main Drainage Committee, and to enter into a provisional arrangement for prosecuting a Bill in Parliament during the ensuing Session.

3. The proposals of the London Sewage Utilization Company are that the Board should grant the company as much sewage as they might require at Barking Creek for two years, at a rent of £5; that, should the experiment be successful, the Board should at the end of those two years grant a further term of 21 years at the same rent; and, at the end of such term, that the company should pay such rent for such further term as may be agreed between the parties, or as may be determined by the arbitration of the President of the Institute of Civil Engineers or by the Board of Trade.

4. The proposals of Mr. Moore are that the Board should grant the sewage for a term of 90 years, of which the first 14 should be at a peppercorn, and at the expiration of that term one-half the profits, after deducting 10 per cent. interest on the capital invested, or on such reasonable return as the Secretary of State may award, to be paid by the grantees to the Board. In a further communication on the 9th of July, 1863, Mr. Moore offers to pay one farthing per ton for every ton of sewage raised by the Board to a height of 200 feet, which, at 80 million gallons daily, would, he estimates, amount to £186,000 per annum. Mr. Moore states that he has already engagements with the occupiers of nearly 60,000 acres for the use of the sewage.

5. Mr. Shepherd, in answer to the Board's advertise-

ment, adheres to the proposals made in his former letters, and states that he shall shortly be in a position to lay before the Board plans for applying the whole of the sewage; that on obtaining a concession he will apply to Parliament for the necessary powers, and asks for a concession of that of the south side first. Mr. Shepherd's letters extend from January, 1860, to the present date; only two communications are of the nature of tenders. The first, dated the 21st April, 1860, asks for a concession of the whole of the sewage of London for 50 years, and offers to divide with the Board the net profits received by the company, after paying 72 per cent. on the invested capital; after 50 years the company are to deduct 5 per cent. interest on their capital. The second, dated 4th July, 1860, refers to the former tender, but requests that the concession shall be full and free, without let or hindrance, on the part of the Board.

6. Mr. Kirkman is a patentee for obtaining manure from sewage by filtration and deposit—the water after such treatment to be discharged into the river. He purposes to erect works for the purpose at Barking, on condition that the Board shall convey to him the necessary land adjoining the reservoir, shall deliver the sewage to him from the main outfall sewer into his works, shall grant him the use of the river frontage and wharves for the term of seven years at a peppercorn, seven years at a rent of one-fifth the net profits, after deducting a dividend of 20 per cent. on the capital expended, and for a further term of seven years at a rent of one-fifth the net profits, after deducting 25 per cent. on the capital, and for any further term at such rate as shall be settled by the Secretary of State. Mr. Kirkman states that he is prepared to guarantee a *minimum* rent of £10,000 per annum, and he undertakes to name two or more securities for the performance of his contract. He consents also to surrender the works on two years' notice, subject to the repayment of the capital invested, and of a premium of £25 per cent. thereon, and to a royalty of 21 per cent. for the use of his patent.

7. Mr. Ellis proposes to pump the sewage from the Board's reservoir to certain covered tanks, constructed at such points as the Board may approve, to flow by gravitation through pipes laid along the sides of the roads adjoining the area to be irrigated, which is also to be approved by the Board. Mr. Ellis, on behalf of the company to be formed, undertakes to provide and use all necessary deodorising agents, and to subject himself in all things to the directions of the Board. He further offers to submit the Act of Incorporation for the Board's approval. The net profits, deducting working and management expenses and reserve

fund, he proposes to divide equally between the company and the Board, and he suggests that three of the directors should be nominated by the Board. The concession of the sewage he requires should be in perpetuity, subject to the Board's power to purchase after 50 years, on giving three years' notice, the price to be fixed by valuers chosen jointly. Messrs. Payne, Eddison, and Ford undertake to pay £80,000 to the credit of Mr. Ellis's local trustees, on his obtaining the concession of the sewage on satisfactory terms.

8. Messrs. Napier and Hope propose to intercept the whole of the ordinary flow of the northern sewage, near Abbey Mills, to convey it by a culvert 44 miles in length to Maplin Sands on the one hand, and Dengie Flats on the other. Both these areas are at present submerged at high water, and their redemption is part of the project, extending to 15,000 or 20,000 acres. The capital proposed to be invested is £2,000,000, the concession of the sewage to be for 50 years, subject to Parliament authority being obtained, and to a grant of the land from the Crown. The net profits to be divided equally between the company and the Board, after a deduction of 10 per cent. on the outlay. The Board to have the power of resuming the grant of sewage and taking the whole of the land and works at a valuation at the end of the term of 50 years, on giving seven years' notice, or a new concession to be granted, on terms settled by the Secretary of State. The Board to be represented by two directors of the company. The company to be formed within two years after obtaining Parliamentary powers. The company, within three months of its formation, to pay into the hands of trustees, chosen jointly, a sum of £25,000, India Five per Cent. Stock (interest to be paid to the company) until three-fourths of the works are complete; the whole to be forfeited to the Board, if the company abandon the enterprise before three-fourths are completed.

Of these plans (one or two of which, however, the promoters keep rather in the clouds), the last-named appears the most comprehensive and bold. Of the engineering difficulties which may attend the enclosure of 20,000 acres of land from the sea, I am unable to judge; but, if that object can be obtained, then there would seem to be no other material difficulty in the case. And, if so, then the enclosure would not only add so much land to our island, but it would most profitably provide for the use of an enormous and rapidly enlarging amount of sewage, and in a locality where the exposure of such a huge mass of sewage on the surface of the land could be free from all sanitary objections.

ROUTINE *versus* PROGRESS.

Some people pride themselves, to use a popular phrase, on a sort of clockwork regularity in all their movements, professional, social, moral, or otherwise. To them it is the philosopher's stone. If so much as an extra hob-nail is driven into the heel of their shoe, it is a downright invasion of their principles by St. Crispin, for which neither rhyme nor reason will serve as a counter-blast. In point of fact, an apology generally makes the matter worse than when let alone. At church or market, at home or abroad, there they are, as they were yesterday, and ever have been, and, if their Star of Destiny can be credited, we may safely add, or ever shall be. How unhappy they feel when any wicked wight takes their chair, their place at table, their corner of the fireside, or even by mishap places the tongs or anything otherwise than it should be, in all that belongs to their peculiar sphere of action.

Even their night-caps must be of the proper colour before they can sleep soundly and comfortably. And odd as all this may seem in print, there is something about it, too, which almost everybody likes in real life. It is a species of sterling conservatism which always passes current, although the better-informed tell us—and tell us plainly too—that it is of a kindred character with the instinct of the lower animals, and the routine habits of uncivilized tribes.

This is not saying much for the origin of routine in the outset, when superficially examined. The lower animals are unquestionably routine in their habits; and this no doubt arises from those habits being governed or controlled by instinct, and not by the more ennobling faculty of REASON. Amongst them there is, comparatively speaking, no progress, when they are left to themselves in a wild or

natural state. Many birds and quadrupeds show a great deal of mechanical artifice in the construction of their nests and domiciles. The insect world exhibit a still higher degree of ingenuity in their constructive mechanism; but throughout the whole the master-spirit of design is routine in its purely unsophisticated form. Thus, the ant, the bee and the beaver, the chattering sparrow in the hedge, and the swallow in the corner of the window, how singularly routine they are, in their domestic, social, and industrial economy! There they are, as they were last year, and as their progenitors have been before them from time immemorial; and if left undisturbed, their offspring will continue to cling to the same locality, and even identical corner of the window, to chirp and flutter, exemplifying routine in all its normal and conservative purity.

But in artless sincerity let us plainly ask, can this be in reality the routine that exemplifies itself so openly in all, but more conspicuously in certain circles of the GENUS HOMO than in others? Has any portion of frail humanity thus fallen, never to rise above the level of the lower creation? And, worse than this, is there an ARCH-ENEMY, whose sworn policy is, and ever has been, to drag mankind to a lower level than the brute creation? Is this the adamantine chain which binds the King of Dahomey with his savage Amazons to the barbarous customs of his ancestors? that binds the more gentle and civilized Hindoo to his castes? the best half of Christendom, numerically speaking, to bygone dreams in things temporal, not to mention those spiritual? that enters so largely into the governmental policy of the Royal Agricultural Society of England, the Highland Society, &c.? that entwines itself around the agricultural body generally, binding antiquated squires and old-fashioned farmers hand-and-foot to out-of-date rules, habits, things, and practices? and, in a word, that constitutes the normal anti-spirit of progress in all classes of society?—that millstone which, revolving upon its own spindle, acts as if everything else should be moved by its attractive force, and thus whirl with it, subject to the same law of gyration!

Granting, for the sake of argument, that such is the present rule, it was not so originally with man. When first created Lord of the Universe, for example, agricultural progress formed no part of his profession. Indeed, it may fairly be said that the contrary was the normal rule at the beginning, bountiful nature filling his horn with overflowing plenty, heaven and earth thus showering upon his devoted head their united blessings in a manner that the language of his fallen race knows not how to express in suitable terms. There were no steam ploughs or threshing machines in Paradise, and as little use for them. Toil and troubles were both unknown. It was after the fall that "sleep Parnassus" raised his sky-capped head above the ordinary level of things, and that Adam and Eve first set out upon the rugged journey of toilsome life, so as to rise above their fallen state, by sewing fig-leaves together.

Such was the first step in the race of progress, and certainly an ever-memorable commencement it was in the new order of things—one that should never be forgotten by any of their posterity.

"Cursed is the ground, for thy sake"—we repeat, generous and gentle reader, "for thy sake"; for the sentence is one of love to our fallen race, and not one of condign punishment, as too many with narrow and selfishly limited views of things imagine. "In the sweat of thy face shalt thou eat bread"; "Be fruitful and multiply and replenish the earth." Such is, briefly, the new and Divine Canon of Industry; and those who cannot see in it the All-wise Hand and Omniscient Eye of One who saw the end from the beginning, and what was absolutely necessary for the very existence of our race, are blind to their own welfare and the best interest of their posterity, temporally speaking; for had the earth yielded her overflowing abund-

ance without toil, cultivation, and even improvements in every branch of art, *how would the few have lorded it over the many?*

It would thus appear, if we are right in this brief summary, that something like the routine of the lower animals was, after all, the original rule; that to avoid the worst of all kinds of tyranny and oppression, social and domestic misrule, it was virtually abrogated or repealed, and the new industrial canon wisely instituted for the welfare of mankind; that what is now generally considered the barbarous pursuit of savage tribes, is neither more nor less than a blind attempt to follow the primitive or natural law, in defiance of the new ordination; and that the progress of science and art in all civilized countries is simply compliance with the latter, the Divine Canon of Industry that now exists, and under which nations, communities, and individuals can only hope to prosper in the world.

This, too, is not all, as will appear manifest when the subject is more closely examined from a physiological point of view. Thus, "thorns and thistles" are not the only consequences of the curse pronounced against the earth; for the health of man, under the new order of things, has become wholly dependent upon industrious habits. In other words, the exercise of both body and mind, in some industrial pursuit or other, is essentially necessary to the physical well-being of man. In point of fact, the very muscles that wield the pen or the implement, or that enable man to stand upon his feet, or that convey the morsel of food to his mouth, will not grow without exercise. There is thus something in the new economy of existence that is singularly unique and complete as a whole. Figuratively it may truly be said, that PRACTICE WITH SCIENCE is now the universally ESTABLISHED LAW to which all mankind, without an individual exception, must render a willing and profound obedience, or submit to the sad consequences of infringement. To eat the bread of idleness is a living impossibility, that, like the shadow of Death in the fable, treads in the footsteps of everybody, from the cradle to the grave. The affluent, the voluptuary, and the sluggard may say, "Take thine ease;" but the richest kingdom of the world, and the finest landed estate in any kingdom, however favourably it may be situated as to latitude, will sooner or later pass from the fingers of its owner, who thus tramples under foot the GOLDEN RULE by which the Almighty now governs the universe! Some may think they were "born with a silver spoon in their mouth;" but it is worse than drinking poison; for the former has, during the untoward history of our fallen race, actually killed outright many times more than the latter. It is equally at variance with this established law for anyone to conclude that he can employ another to act for him, and thus allow him to sit down in the easy chair himself, or that he has got to the end of the race of progress, and therefore should make no further effort in the march of improvement. Both these maxims are largely acted upon; but they are diametrically opposed to the above golden rule, for while Practice with Science propounds the greatest subdivision of labour, it at the same time condemns its abnegation or subversion.

In no department of industrious pursuit are these general conclusions more forcibly illustrated than in the agricultural world. Thus, where temperate and industrious habits are properly cultivated, we see the greatest development, not only of physical health and strength, but of the intellectual faculties also, and this, too, under a system of management that is yet subject to great improvement. No doubt it must be admitted that a very large proportion of the inhabitants of our rural provinces do not enjoy that degree of mental and physical training which their healthy out-door exercise is calculated to confer upon them, owing to improper clothing, food, and household accommodation,



*A bison of the
 The property of William Henry & Co. of New York and New York City
 shown at the Fair of 1853, New York City, June 1853.*

but all aiming at the like result. The best, and, according to my judgment, it will soon be the most popular, is the culture by steam power. These ponderous and most powerful implements are manufactured with the view of doing a great deal of work in a short space of time, and to do that work well. Now, so far as I have seen them in use, I will venture to say that we have never had such an effective and useful class of implements yet applied to tillage work. It is of no moment as to the state of the soil. If it is as hard as flint, they tear it up and into pieces ready for pulverization. Imagine a farm of 300 acres of arable land, from three-fourths of which the crop has been removed, the other being under root crops: see the remaining all broken up at adequate depth in about three weeks from clearing, and followed by harrows, rollers, &c., to bring it into the most desirable state of culture. When was this ever done by horse-power? It is impossible for a farmer to do it with the ordinary horse-power of his farm, and to hire teams at this season of the year in sufficient number to accomplish the work is equally impossible. Steam cultivation will in this way (and in this way alone) effect a revolution in cultivation.

The main object in autumn culture is to secure the speedy breaking-up of the soil immediately after harvest. For this purpose, every crop should be closely mown, so as to leave the land ready to work. The cultivator, scarifier, skeleton plough, broadshare, or whatever other implement can be brought into requisition, should immediately be set to work to *break up*, not *turn over*, the soil. Turning over the soil puts so many seeds of weeds down, that will not vegetate till turned up again. This is wrong. Harrows, rollers, and rakes for working out and collecting the rubbish and stubble roots must follow; all to be

taken off to the foldyard, to be converted into manure—not burnt, as is too commonly the case, in order to save trouble: much valuable manure is thus wasted, to the lasting injury of the farm. The land should also be carefully looked over and cleanly picked. It should also be reduced to a tilth fine enough to promote the vegetating of every seed of weeds and of the late crop, which should then be left to grow for a time. Immediately preceding the autumnal or wheat seeding, the land should be ploughed and the seed drilled in daily, so that all goes on simultaneously. In this way very many crops are secured against, and notwithstanding it may be in the most critical seed-time. In many cases the soil becomes so well worked, and is so clean and admirably prepared, that ploughing is not really requisite before the seeding. When such preparation can be secured on land properly subsoil-drained, the seeding or drilling may proceed without any danger, often with great benefit, as on light soils it becomes more easily consolidated in the spring, a matter of great moment to a sickly wheat plant. There may in some cases be danger from overmuch treading, in consequence of the absence of furrows, down which the horses might walk. The chief preventive is watchfulness in choosing the best time for the seeding. On light and dry lands it is advantageous to permit the treading. Where potato or mangold culture is much practised, and generally followed by a wheat crop, it is not desirable to attempt much cultivation, but to get up the crops as well and speedily as circumstances will permit, and then plough and drill in accordance with the farmer's best judgment; a recommendation by no means insignificant, for, of all properties or qualities of mind necessary to ensure a successful farmer, that of a correct or intuitive judgment stands pre-eminent.

FLAX CULTURE.

The counsel we have frequently put forth, as to the desirability of increasing our own production of flax so as to be more independent of foreign supplies, and at the same time stimulate the activity of our mills, is, we are pleased to mention, beginning to have some effect. On all sides we see progress making of a very energetic kind. In Ireland there has been a much greater breadth put under flax. In Dorset, Somerset, Norfolk, and in certain parts of Yorkshire, flax is grown in small quantities; but in England generally this crop makes but little head. The great consumers of flax and hemp are, however, still obliged to import the chief bulk of their supplies from the north of Europe; and it does seem strange that Russians, Belgians, and Poles, should be able to grow, manage, save the seeds of, and dress flax better than Englishmen, and, in addition, furnish them with that cake which costs so much, as well as adds to the weight of their sheep and bullocks.

The acreage under culture with flax in Ireland this year, according to the statistical returns of the Registrar-General, shows a very large increase over any preceding year. The extent of flax grown in Ireland this year has reached 214,093 acres, an increase of 64,082 acres over last year, which, with 1853, were the years when most land had been put under culture. The great bulk of the increase, 61,000 acres, is of course in the province of Ulster; but even in the other three provinces there is an average increase of 1,000 acres each in the land under culture with flax, as compared with 1862. Down is still the largest flax-growing county, having 45,000 acres devoted to it. Tyrone stands next in order, with 32,000 acres.

The value of the annual production of flax fibre throughout the world was estimated, three years ago, at £20,000,000,

and of the seed at £4,000,000; but since the outbreak of the civil war in the United States the price of this raw material has suddenly risen, its production has greatly extended, and its cultivation has received a sudden impetus, so that the entire value of the crop in Europe may now be estimated at £30,000,000 per annum, with every prospect of a rapid increase. In the production of flax in Europe, different countries take the following rank: first, Russia; second, Austria; third, France; fourth, Ireland; fifth, Prussia; sixth, Belgium; seventh, Holland.

In the United States flax has never been a favourite crop as a fibre-producing plant. "It is to be regretted," says the superintendent of the United States census for 1860, "that the manufacture of flax has not attained greater magnitude in a country where the raw material is so easily and cheaply grown. Farmers throughout the West have raised this crop simply for the seed, and thrown out the fibre as useless." The census of 1860 shows that there were produced in the States north of the cotton States 4,547,000 lbs. of flax. This quantity would require, at 200 lbs. an acre, about 23,000 acres for its growth. But in the same States there were grown in the same year 484,779 bushels of flax-seed; and which, at eight bushels to the acre, would require a little over 60,000 acres; showing that nearly two-thirds of the fibre was thrown away.

There are three directions in which we may look for increased supplies of flax from our own possessions—Canada, Northern India, and Australia. Notwithstanding the admirable fitness of the climate of Canada for the cultivation of flax and hemp, and the encouragement in a certain direction which has been given to it, it appears that the importations into that province are very considerable.

ble, and last year reached the imposing sum of £30,000. Much has been done of late years in Canada by private and public enterprise to assist the cultivation of this important plant. The Canada Company some years since placed a sum of money at the disposal of the Agricultural Association to be given in premiums for flax and hemp, and the Association itself offered other prizes and diplomas for the same object. In October, 1854, a voluminous report was submitted by Mr. Kirkwood to the Minister of Agriculture, on the system of cultivation of flax as practised in Belgium and the British Islands, and published in the Colonial Parliamentary Reports of that year. The letters of Mr. Donaldson, the Government emigration agent, published in different newspapers in Canada, furnish an excellent summary of the attempts which are now being made to introduce the cultivation of flax and the promising results already attained. Private individuals have offered prizes, to stimulate farmers to grow this product. Associations have been formed in Upper and Lower Canada to effect the same purpose; and recently the Government has imported flax scutching machines from Europe, and distributed them throughout the province.

In 1862, the Colonial Government caused public lectures to be delivered, on the importance and advantages of cultivating textile plants in Canada; and the Department of Agriculture and Statistics has been importing first-rate seed from Europe for distribution. Extensive factories are in course of construction, for the manufacture of flax; and the Board of Agriculture of Lower Canada has imported new machinery from Europe for a similar purpose. The Minister of Agriculture, after a brief recapitulation of what has been done to promote the cultivation of flax and hemp in the colony, concludes his report for 1862 with the following words:—"The Legislature should, therefore, vote a special amount this year for this purpose."

Something has been done, of late, also in India, to extend flax culture, and very good specimens of prepared flax and flax stems from native and from acclimatized seed, grown in the Punjab, were sent by the Lahore Committee to the late International Exhibition in London.

Flax is mentioned by Strabo as one of the staples of that part of India. A small quantity of Riga seed, which had been imported expressly by Dr. Jameson, superintendent of the Government Botanical Gardens at Singapore, was lately distributed amongst the peasants, with instructions as to the mode of cultivation. An agent of great practical experience was deputed to examine and report upon the qualifications of different districts for the growth of flax; and a staff of natives were trained by him to act as satchers.

In 1856, two tons of flax produced under his superintendence, in the district of Goojranwalla, were sent to England, and sold for £92, realizing a net profit of 47 per cent. In 1857, 8 cwt. of flax, grown at Juddura, a tract of country in the Kangra district, bordering on the river Beas, was sent home, and was valued at from £55 to £60 a-ton. In consequence of the success of these experiments, an association, called the Indian Flax Company, was established at Belfast, and sent out Mr. Wightman, an agriculturist, as agent, to buy up flax-produce. He has made the district of Sealkote, in the Punjab, his head quarters, and, as far as can be judged, has every prospect of ultimate success, as the natives are now beginning to see that there is a day of large profit before them, and join heartily in the movement.

The growing of flax in Australia has been at different times spoken of, as an article of commerce: but the matter was allowed to drop, or laid aside as a thing, if not impossible, at least improbable, the soil being, in the estimation of some, unsuitable, as well as the scarcity and price of labour being such as would make it unwarrantable

even to give it a trial. There is one great fact that ought to be universally known in the commercial world, and that is that there are in Australia hundreds of thousands of acres of wild flax growing along the banks of the rivers, on the immense alluvial flats and numerous swamps, in some places so thick that it would be difficult to determine which was the predominant crop, grass, rushes, or flax. Years have now passed on, and no trial has been given to cultivate that valuable plant, which the very soil itself declares in unmistakable language its suitability to grow. There is, then, an indigenous plant growing there, on land the least remunerative now, but which could be made the most productive land in the colonies, whether of South Australia, Victoria, or New South Wales. By proper cultivation a finer article could be produced than any of the European flax, or at least equal to the finest flax produced in Belgium or France. The time is fast approaching when necessity will suggest a greater variety of pursuits than at present exist, and industry will have a wider field and freer scope in a country possessing so many valuable natural endowments, both as regards soil and climate.

THE DUKE OF DEVONSHIRE ON AGRICULTURE.—On Friday se'nnight the Duke of Devonshire, who presided at the Annual Dinner of the Keighley Agricultural Society, said that that day they had seen specimens of as good animals in the Shorthorn breed as were to be found in the whole country. Of course such animals were not to be found in farmyards of agricultural tenants generally, but they would take a very mistaken view of the subject if they supposed that the benefit of this high breed in animals did not extend far beyond the possessors of them. It was due to those who had spent many years in the breeding of that description of stock to remark that whatever might have been the result, so far as their own pockets were concerned, the agricultural classes generally had derived benefits from their labours. In every part of the country the good effected by the infusion of that high-bred blood was now felt more or less. Great as had been the advance of this country in almost every department during the last 20 years—so great that it was thought the farmers could not keep pace with it—yet, when they took a fair, dispassionate view of it, he really believed that the progress that had been made in farming matters was not less remarkable and rapid than that which had taken place in every other department of English industry. Every one connected with agriculture was so familiar with the great topics to which the attention of the agricultural world had been called, that it was almost unnecessary for him to refer to them; but on that occasion, having been almost invited to take a retrospect of the 21 years of this society's existence, he would call their attention to the question of drainage, which was the first and greatest of all improvements—then quite in its infancy, now so familiar that it was hardly necessary to allude to it. It was the very rudiment and first element of good farming. In how few words could the stock of implements which the farmer had at his command at that period be described! But now he knew nothing so surprising as to gaze at the vast array of implements of the finest construction which they had seen that day, and which they saw at the exhibitions of agricultural societies generally. Perhaps this might serve to display the ingenuity of the makers; but, at any rate, a very large proportion of them had done good service to the cause of agricultural improvement. He believed it was scarcely ten years since the first reaping and mowing machines were introduced into this country. Now, in many parts, no farmer thought it possible to get in his crops without the use of them. Then they saw, as the final triumph of science, the application of steam playing an important part in all departments of agriculture. Indeed, it was long since in all the purely arable districts that portable steam engines superseded both the flail and horse thrashing machines. He, himself, though not very far advanced in years, could remember the time when there were great disturbances in some parts of the south of the

country because of the introduction of the thrashing-machines, and when agricultural labourers threatened little less than an insurrection unless the use of them was discontinued; but now it was hardly possible, even if any one wished it, to get a labourer who would submit to use the flail. The district in which he was making those remarks was not perhaps one in which many of those topics attracted great attention. It was a district of small farms; but still every portion of the agricultural world must feel an interest in what concerns the general advance of agriculture. He was well aware that it would not do to talk of everything as if it were bright, and as if there were no dark side to the picture. At any rate, if there was not a dark side, there was a side of which they could not speak with anything like praise. However great the advance made in some parts, there was still much connected with land both for owners and occupiers to do. Everyone was aware that much improvement could not be made where the land from careless management had been left to produce half what it was capa-

ble of producing. They still saw there was a vast deal of niggardly and parsimonious management, assisted at the same time by wasteful management. A farmer grudged the proper outlay for superior articles; he allowed his manure to run to waste, and his crops to be over-run with weeds, and that was a niggardly, a parsimonious, and wasteful management. At the same time, there was every reason to look forward with confidence to the prospect before them. The last 20 or 30 years had worked remarkable changes in the direction of agricultural improvement. They had every reason to believe that the influence of good example—that the influence of the Keighley and other agricultural societies would tend to promote that improvement; and he looked forward with confidence to the time when no one would venture to make such remarks as those he had just offered, and which now formed the exception to the rule. Every one, however, who travelled along the railway must see that there was a great difference between the well cultivated and the badly cultivated land.

THE AGRICULTURAL LABOURER AND THE EMPLOYMENT OF MACHINERY.

If, some three or four-and-twenty years since—and we may as well take as the era of advancement the establishment of the Royal Agricultural Society—if at that time any man had maintained that the best means for improving the condition of the labourer would be the employment of more machinery, it is a nice question whether any assemblage of agriculturists would have heard him out? If he had, however, gone on to say that the increased use of mechanical aid might tend to a proportionate demand for manual labour, the absurdity of his argument would have carried with it its own condemnation. Even the most enlightened farmers of those comparatively-remote times introduced a thrashing-machine or a hay-maker with a kind of apology to their workmen, and a promise to make it up in some other way; while friends and neighbours shook their heads, and doubted whether any such an innovation was not as dangerous as it was unfair to the lower classes. And yet we have gradually arrived at some such a conclusion as that the enthusiast would long since have demonstrated. No one will now go to declare that the barnman suffers in purse or person from the use of the steam thrashing-machine, or that the steam plough is calculated to make a worse man of Will Whipcord than when he *gee-woa'd* his four horses in a never-ending succession of tedious bouts. Nay, glorious as was the harvesting, which, like an old-fashioned election, lasted for weeks instead of days, the most stalwart of gangs or companies may make better terms with a mower or reaping-machine than ever they could by the scythe or the sickle. The secret, in fact, of the labourer's success in life must henceforth depend upon his skill and intelligence. The popular argument of the autumn has been, once more, the necessity for improving the poor man's dwelling, pointed as it has been against landlords who continue to deliver fine philanthropic addresses, while the most miserable huts and hovels still disgrace their estates. Something like this may do sooner or later to remedy the evil; but the pressure must eventually come with much more force from another quarter. As we educate the farm-servant—as we develop his mind and his skill—as we needs shall do, to render him equal to the management of the modern implements of husbandry—and, as we raise him to something of the position of an engineer, or a mechanic, so surely shall we open his eyes to the every-day wants of a decent home, and its concomitant comforts. Without the temptations of the townsman to dissipate his earnings, the agricultural labourer, as his abilities expand and his status advances,

has every promise of becoming a far more respectable member of society. But to accomplish this, we must, in the first place, heighten his ambition, and teach him to regard with as much care and fondness the new cultivator or the prize engine as he was wont to bestow on his market team or the dairy cows.

It is satisfactory to see that the landlords are impressing this great truth upon their tenantry, fully conscious, no doubt as they are, of how much depends upon themselves in bringing about a better state of things. It must, at the outset, be accepted as an established maxim, that if the labourer is to be a better man and a better workman, he must have a better house. If you enlarge his mind without providing such accommodation for him, it will be only the more to disgust him with his home, and every increase of means will be but the more likely to be wantonly squandered, mainly from the want of a proper object upon which to expend them. Eventually, as we have said, the man may insist upon something better; but, in the interim, the struggle will be longer, and the progress slower, unless his employers come to meet him half-way. Let us, then, associate skilled labour and decent lodging one with the other, and we may thus be able to read aright all we have heard of late from the cross-table. At Keighley, a week or two since, the Duke of Devonshire, who presided, "believed it was scarcely ten years since the first reaping and mowing machines were introduced into this country. Now, in many parts, no farmer thought it possible to get in his crops without the use of them. Then they saw, as the final triumph of science, the application of steam playing an important part in all departments of agriculture. Indeed, it was long since, in all the purely arable districts, that portable steam-engines superseded both the flail and horse-threshing machines. He himself, though not very far advanced in years, could remember the time when there were great disturbances in some parts of the south of the country because of the introduction of the thrashing machines, and when agricultural labourers threatened little less than an insurrection unless the use of them was discontinued; now it was hardly possible, even if anyone wished it, to get a labourer who would submit to use the flail?" This is all in the right direction, though Lord Nass, in a speech of remarkable ability, which he delivered as chairman of the Cumberland and Westmoreland Society, takes the line of argument much further: "It was thought very generally that the application of machinery would do

away with a great deal of manual labour; but, instead of that, it has ever been found where machines are introduced that the number of labourers is not diminished. There is now as great a number of people employed in agricultural pursuits as at any other period of our history (loud applause). No, gentlemen, the labourers have nothing to fear from the improvement and introduction of machinery; and this always renders necessary an increased expenditure of capital, the result of which is that production is augmented, and a greater number of persons are required in consequence. This has been found to be the case in other industrial pursuits, and the same rule holds good as applied to agriculture. I say again, the labourer has nothing to fear from the introduction of machinery. Never since machinery was applied has it had the effect the labourers dread; the only difference which the labourer will find will be, that the labour in which he is engaged is not quite so severe as under the old system (applause). I admit that in some few cases individuals may suffer, but the great bulk of the working-class will reap immediate and permanent benefit from any process that augments the prosperity of the particular industry in which they are engaged."

The chief aim, as we insist, of this reasoning must be to so incite the labourer as to render him equal to all now required of him; and such a duty we must leave to the farmer himself. It will be a great day for either when they can at once dispense with the services of the man at the works, and take the new implement into their own management as readily as they would break the two-year-old colt, or put in the rick they were going to thrash. And the farm-labourer needs only this signal to advance, as was forcibly impressed upon us within the last day or two, when going over the Messrs. Garrett's famous Works at Leiston, in Suffolk. In this establishment from between six to seven hundred men are continually employed in some of the nicest descriptions of mechanism, the perfect

execution of which is a real pleasure to witness. There is everywhere, indeed, an air of educated power about the men, and even the very lads, that is eminently suggestive of the good school in which they must have been grounded. The quickness with which they master the new inventions—and in a manufactory of this calibre any aid likely to be of service is instantly seized upon—the very genius that "hand" displays for directing the morticing machine, the innate taste of another for moulding and modelling, and the smartness with which a third fashions and fits—the performance of all or any of these duly-apportioned pieces in the great whole to such a business, amply demonstrates how systematically skilled labour may be obtained and directed. No doubt, either, but such workmen have been sedulously gathered together from all parts of the kingdom? On the contrary, a great majority of them were born and bred in the immediate neighbourhood of Leiston, and had they not been taken on at the Works, might have been holding plough or hoeing turnips. But, then, they begin early as apprentices, with every inducement to continue and succeed in the pursuit they have adopted. You may mark their comfortable cottages, not only in the village, but the adjoining hamlets; while their dining-room is as spacious and as lofty as that of the "Carlton" or "Conservative," with a mechanics' institute above, to supply in food for the mind the companion requirements of the Club-house. There is a moral in all this for the farmer to study, demonstrating as it does the advantage of master and man pulling together. There is a mine of gold in the agricultural labourer, if we only go the right way to work the lode; and the illustrious Geoffery Gambado, in his famous lessons on horsemanship, pointed his instructions by a couple of illustrations of very general application. These were—"How to make the most of a horse;" and, in antithesis, "How to make the least of him."

ANNALS OF THE ROUND TABLE.

In this paper we have to examine the dictary of the agricultural labourer from an economical and pecuniary point of view. The question is thus principally a housekeeper's one. With from ten to fifteen shillings a week how are we to clothe, feed, and educate a family consisting of a hard-working man, a wife, and say half-a-dozen children? We may talk of the most suitable clothing, from the boots upwards; descant upon the most nourishing diet, under the peculiar circumstances of the stomach, and the extra tear and wear to which the body is subject; and we may also direct special attention to the growing demand for a higher standard of education than has hitherto been the lot of the ploughman, in order to qualify him for steam-ploughing, and the other advances in applied science that are now being so rapidly made in connection with agriculture; but, to be practical, our proposition must fall within the margin of the labourer's wages. The ploughman's expenditure must not exceed his income. He has got his balance-sheet to attend to, as well as his employer; and the cottager's wife, who has only twelve shillings in her pocket on a Saturday night with which to provide for the daily wants of the ensuing week, has got a financial problem more difficult to solve than that of the Chancellor's budget; and yet how gladly does many a lassie's heart beat at the prospect of leaving the farm kitchen, where plenty abounds, to undertake the hopeful cares and anxieties of doing it to the satisfaction of the lad she loves! And how often, too, she triumphs in her domestic enterprise, is amply borne out by innumerable healthy, contented, and well-to-do families! How truly may we append the oft-repeated story, "Little does half the world know what the other half is doing!"

In every department progress is a work of degrees, and we

have only to take a very cursory glance at the past to perceive that the wages of the labourer have been advancing with other things, so that for the future his income in this respect will be no exception to the common rule. If, through the instrumentality of improved machinery, with a higher degree of education and professional skill, he performs more work of a higher standard as to quality, it is but fair and reasonable that he should participate in the advantages thus gained by his employer; and this is what the experience of the past confirms he has done; and therefore it is the duty of every agricultural servant, male or female, to exert themselves in the use of those means at their command for advancing the common interest which they have in the general progress of agriculture. To oppose the introduction of improved machinery for abridging manual and horse labour, as has not unfrequently been done, or to neglect to cultivate provident and exemplary habits in domestic life—as more economical and scientific systems of cooking—thereby throwing themselves occasionally upon the poor's rates, is ignorantly to sacrifice their prospects of advance in the world. It is no easy matter, we must confess, to get farm servants to reason the matter with themselves as to the philosophy of their profession in many cases; but we have always found it the most prudent and successful course to treat them as intelligent beings, and to encourage and remunerate them according to the progress they make, not only at farm work, but also in their own domestic and private affairs, even to the food which they eat, the raiment which they wear, and the education they give their children. We look upon this, which is neither more nor less than the physical, moral, and domestic training of cottagers and their families, as the first professional duty of a farmer; for the whole, old

and young, are apprentices, inasmuch as they have to learn the daily progress made; so that every advance the farmer himself makes, he is both in duty and in interest bound to teach his labourers the same, no less by precept than example.

The economy and cost of food is a very comprehensive question to a labouring man who has to perform daily his stated task, and to rear a family. The high prices of some articles of diet place them beyond his reach, while the money value of articles, generally speaking, is seldom a fair index to their nutritive value. Thus, a pound of rump-steak at a shilling may supply more nourishment to the body than two pounds of inferior fat beef or mutton at half the price, or sixpence per pound; and *vice versa*, a pound of lean meat from the neck of a rich carcass may be worth more than a rump-steak from a carcass of an inferior quality. According to Majendie's experiments, "Dogs fed solely for 120 days on raw meat from sheep's heads preserved their health and weight during this period; the daily consumption never exceeding 800 grammes (equal to 4530½ grains troy), and often being less than this quantity. But 1,000 grammes (equal to 15,434 grains troy) of isolated fibrine, with the addition of some hundreds of grammes of gelatine and albumen, were insufficient to support life." When fed exclusively on fat, dogs experienced a similar issue, although after death their carcasses exhibited a remarkable hyper-trophy of fat. Again, vegetable food is subject to the same laws of economy; for if it consists wholly of any one elementary substance, as starch, like results are produced; or where the nutritive elements are not supplied proportionally according to the demand of the organic laws, an extra quantity must be consumed in order to enable nature to perform the reparative and vital processes of the system. Rice and potatoes are examples of this latter kind; hence the big bellies of those who live on such unnatural food, the stomach often being so disturbed as to incapacitate the labourer for a continuance of hard work. Now, in all such cases there is a sacrifice of health and strength, as well as of food and money.

The advantage of a proper diet is easily felt by any labouring man. It is also easily seen in nursing-mothers and their children. It is, for example, depicted in their very countenance, and in the manner old and young set their feet to the ground. There never has been, and never can be any mistake about the matter. It is now forty years since we began to engage farm servants, and the first inquiry has always been to ascertain the manner the servant had been brought up by his or her parents; and many of the servants themselves are perfectly aware of the object of such an inquiry, for those who have been starved or improperly fed, when children, seldom get the benefit of their food, and hence are seldom very healthy or fit for their work, while they are almost invariably more difficult to please as to quality. In short, properly fed children are worth more money or longer wages, when they enter service, than are those who have been improperly fed, and the difference, we believe, is deserving of more notice than it perhaps generally receives.

The most economical kind of food is thus a question of personal experience; and every farmer and labourer should endeavour to make himself experimentally acquainted with its solution. It is, in point of fact, the dietetic question which all, one way or other, endeavour to solve; but, unfortunately, how often is taste perverted, and judgment led astray, by the force of fashion, penurious or improvident habits? Thus, two cottages may receive equal wages in every respect. The two families may be equal in number, follow exactly the same economical routine both as to food and clothing, and consume the same quantities of meal, milk, potatoes, and other things, and yet the two be found in very different circumstances—the one cottager and his family being in a healthy well-to-do state; the other cottager and his family exhibiting evident signs of want and poverty. Very frequently the former saves money, thus consuming less meal and wearing out fewer clothes than the latter, who cannot (to use a common-place phrase) get the two ends of the year to meet. Again, two healthy men receive and consume equal quantities of oatmeal and milk, and yet, owing to a difference of management in cookery, the two are very differently nourished and circumstanced to perform their work. Some men never do well on their "brose," because they have never learned how to

cook them. Some save and sell part of their allowance of meal, and are yet fitter for their work than others who purchase, and thus consume more than their allowance, because the two do not derive equal benefits from equal quantities of the same quality of food. This latter difference may arise from the two men having been differently fed when children, the digestive and alimentary system of the one that had been improperly fed in infancy or youth having been impaired, so that it does not perform its functions normally, as shown in a previous paragraph; or it may arise from hereditary maladies of some kind or other, derived from one or both parents; or it may arise from a difference in the moral habits and temper of the two men. The most conspicuous differences of economy, however, are exhibited in those cases where the cottagers pursue different systems of dietary, clothing, &c., &c. As they are the most interesting and instructive, an example will be the most successful manner of examining their respective merits, with a view to stimulate improvement.

In the most successful examples of cottage economy as to dietary, the cottager and his family sit down together and partake of the same meal. In not a few cases, and at some seasons of the year, as hay and corn harvest, the cottager himself may breakfast and dine in the field along with the member of the family who carries his diet. In corn harvest the common practice in most counties of the north is for farmers to furnish the breakfast and dinner. This is done purposely to prevent any hindrance, and to allow cottagers' wives to make the most they can at harvest work, when their families will allow them to be out; so that the workmen have these two diets as part of the extra wages of this busy period. But at ordinary seasons, if the cottager is working at a distance from his cottage, it is a matter of economy between him and his wife that the latter or some of the youngsters shall carry the breakfast and dinner to the work. This dieting out, however, is against the family, and therefore cottages should be situated as conveniently as possible to the work, so as to permit of the workmen going home, as is generally the case with the cottages of ploughmen and cattle-men. In this the respective interests of the employed and of the employer are mutual, so that every possible means should be used by landowners and their tenants to permit cottagers and their families sitting down together at their meals; for such may not inaptly be termed the foundation of domestic economy and happiness in the cottages of our workpeople.

As to the dietary of the above successful examples, there is a considerable diversity in this and in every other county of the north; but generally speaking the meal is of a substantial kind at breakfast, dinner, and supper, and rather spare as to quantity than over-abundant. In other words, everything is select, and of the best quality—"well cooked," in the ordinary sense of the word, and as concentrated as possible. The sundries embrace oatmeal, wheaten flour (sometimes oats, peas, beans, wheat, and barley are ground together, and bread made in various ways of the meal), potatoes, garden vegetables, yellow field turnips, milk, butter, cheese, eggs, poultry, fish, and occasionally beef and mutton—very seldom pork—tea, coffee and sugar, molasses, with the ordinary condiments, viz. pepper, mustard, and salt. Of these, oatmeal, milk, potatoes, and vegetables from the garden, form the staple articles of our cottage dietary. The quantity of eggs, butter, cheese, and fish is, however, by no means inconsiderable in the best kept cottages. Into the details of cookery our space will not permit us to enter at present. Breakfast and supper consist principally of porridge-cakes and milk; while oatmeal, milk, and vegetables are made into more than a dozen different dishes for dinner—only one being used at a time. Thus, if cabbages are the vegetables, these are boiled with no more water than is necessary to make "the brose,"—i. e., the oatmeal with a sort of hasty pudding—for the family. This pudding is first eaten, then the cabbage along with oatmeal cakes or wheaten bread, and this constitutes the dinner meal. And a very substantial one it is, if properly cooked—a dish celebrated in song by Burns, Allan Ramsay, and almost every Scottish poet of any note. In the farm-kitchen a joint of beef or mutton is generally put into the "kail pot," which greatly improves both the "brose" and the "kail." And a thrifty cottager's wife frequently makes a bone reason the family meal oftener than once.

The practice of a substantial diet for all the members of the family is sound, being in accordance with their respective physiological requirements. The conclusion that the cottager himself requires food containing more of the elementary matter of the tissues, or flesh-forming matter, as such has erroneously been termed, because of the extra tear-and-wear upon him than the other members, is not sound; for the old practice of sloppy food to nursing mothers and healthy growing children has been tossed overboard, and the very opposite substituted in its place. The cottager's wife requires as substantial a diet as himself, and, if nursing, one even richer in nitrogenous elements. Healthy children also require plenty of exercise to promote the development of muscle; and hence a large supply of the same kind of elementary substances. But muscular flesh contains many more substances than the protein alone, and, as not a few of these are yet unknown, save under the somewhat occult designation of omeosoma, or extractive matters, they also must be supplied before the reparative process can be successfully carried out and new muscular matter be elaborated to perform the functions of the old that has been discharged from the system. Growing bones may consume or use up more bone-earth than those that have arrived at maturity: so reason our agricultural chemists; but we have no satisfactory evidence as yet to warrant such speculative conclusions being admitted into applied science as established physiological data. No doubt there must be and is a difference in the consumption of flesh-forming, bone-forming, and heat-producing substances, especially of the former and latter class. This we see exemplified in the natural dietary of the inhabitants of different latitudes; but the practical evidence thus adduced militates in favour of the substantial diet for wives and families, and against the common one pursued in England and Ireland, of potatoes, tea, &c., for them, and the more substantial and solid food only for the labouring man. So long as fat was erroneously considered the most nourishing part of the meat for a hard-working man, nursing wife, or growing children, the practice of butter and potatoes, or puddings of starchy flour and suet or lard, was in accordance with the erroneous notions thus entertained; hence its popularity. But it is high time this popular fallacy and erroneous practice were expelled from the cottages of our work-people, and sounder views of dietetic principles entertained; for if the extra tear and wear upon the muscles of a hard-working man produces an extra degree of heat, as they doubtless do, as addition of the most heat-producing of all substances of food, viz., fat, to a diet of potatoes that naturally contains an extra supply of such heat-producing material, reminds us of carrying coals to Newcastle, as if purposely to consume every muscle and tissue in the body of the workman by the sheer force of combustion. Such a diet may keep an Irishman or a Highlandman comfortable as regards animal heat, and account for the little work they do. It may do more than this; for it may account for the pallid looks of half the children in the rural villages of England, and of too many in our own farm cottages, where such food is beginning to be used. But the practice involves an inestimable amount of prodigality in a two-fold manner; for the poor children are not only improperly fed during infancy, but also abnormally organised, i. e., pot-bellied, their digestive and assimilating functions being so impaired that when grown up they do not derive the full benefit of proper food—as formerly explained. Now, the very reverse of this is what the substantial food under notice produces; for wives and children are free from those abnormal blemishes, being healthy, and strongly formed, and temperate in diet, because they derive the full benefit of the nourishment it contains. And the children are not only the most healthy, happy, and contented when under their parents' roof, but the most intelligent, sober, and industrious cottagers when they arrive at manhood and womanhood, and obtain houses of their own and families.

On less exemplary cases, where the cottager has one diet, his wife another, and his children a third, we do not intend to say anything more than we have done indirectly in the last paragraph. Cases of this kind, we regret to say, are increasing in number—the more the pity. The most exemplary cases, as noticed above, are subject to much improvement; but this is progress in the wrong direction, and one of the greatest difficulties experienced in counteracting this retrograde movement will be to convince some thrifty folks that

sausage for the goose is sauce for the gander. We have purposely said nothing about the economy of the dietary of our unmarried servants. On our own bothy system there is not only a diversity of opinion, but a manifest misunderstanding as to matters of fact, and therefore in another article we shall endeavour to set both parties right by showing that there ought to be no diversity in the dietary of our workpeople. The bothy dietary is just about as antiquated as ninety-nine per cent. of the bothies themselves.

MAN-O'-THE-MEARS.

CONTAGIOUS EYE DISEASE OF CATTLE.—There are few diseases more to be dreaded amongst human beings than that form of malignant inflammation of the eyes which occasionally prevails to a very serious extent amongst children, and which has from time to time affected soldiers in the field. Its tendencies are to spread, and to doom to blindness all who are not properly treated, and even not a few that are very judiciously managed by able surgeons. In various parts of the continent of Europe occasional outbreaks of a similar disease have been witnessed amongst cattle. It has been usually attributed to the dust of roads inflaming the eyes of cattle driven from market to market. Heat certainly favours the progress of the disorder, and if recent investigations by human oculists can be relied upon, it would appear that heat operates by drying the discharge which flows abundantly from the orbits, and particles of this dried pus are blown about in the air, and infect healthy animals. During the last ten or twelve years the malady has appeared in England, and this season it has committed ravages in various counties, but especially in Lincolnshire. Heat and dust have certainly not been lacking; but that these have not been the only causes may be determined from the fact that the malady has been most rife on cattle-dealers' farms, and so far as we are informed, only spreading to home-bred stock from newly-bought animals. We are not aware of the disease having yet appeared in Scotland or Ireland, and we should be happy to learn of the manifestation of the disease wherever it may occur.—**SYMPTOMS:** Cattle in apparent health are observed to shun the light. One eye is more affected than the other, and sometimes only the one is seized. The eyelids are closed, swollen, and tears trickle down the face. On opening the lids, the membrane of the eye is found of a deep scarlet tint, and the transparent part of the eye has at first a moist and glassy hue. Within a very few hours, a film forms over the globe, and the centre of the transparent cornea becomes of a reddish grey colour. The film grows thicker, the pain the animal experiences is intense, and the fever dependent on the acute local irritation runs high. A strange change then follows, for the transparent cornea becomes prominent, and conical in the centre. The fluids within the globe seem to be forcing their way out, and in some cases ulceration sets in, and the eye-ball is irremediably destroyed. In other cases, the surface of the globe gets thickened, the animal becomes totally blind with the one eye or both, and then recovers in general health, but never regains its vision. The tendency to conical protrusion and degeneration of the transparent cornea has led to this disease being termed *staphyloma*. The disorder spreads to every animal kept with affected ones, and nothing can be more pitiable than to see a blind herd of bullocks or cows.—**TREATMENT:** Fortunately, the disease can be treated with success; but on various farms where we have seen the malady a number of blind cattle could be found. Bleeding and emollients must be strictly prohibited. Purgatives are of great service; and the sick animals must be removed from amongst the healthy ones, and shut up in dark sheds or stables. A seton can be inserted near the affected eye on the side of the face, and various lotions can be used. The best is at first a lead and opium wash, which materially relieves. It can be followed up by chloride of zinc lotion, or a nitrate of silver collyrium. The practice of blowing burning alum in the eye is to be deprecated, as it leads to intolerable suffering. The disease lasts from a week to ten days, but it may be cut short in two or three days if properly treated at first.—*Scottish Farmer.*

SUN-SPOTS AND THE WEATHER.

The breaking out of a great number of groups of spots on the solar surface during the past few weeks has called the attention of observers to this most singular phenomenon; and the question has been mooted in the daily press, whether or no these outbreaks may be connected with atmospheric peculiarities? In attempting to throw a little light upon the subject, it would perhaps be as well if we briefly explain the appearance and probable cause of these sun-spots, as many of our readers might never have had an opportunity of examining them with a telescope of high power, and it is only by the aid of such instruments that we are enabled to obtain any idea of their true nature.

If we are to believe the records of the Chinese astronomers—a matter open to considerable doubt—a large spot was observed by them on the solar disc as early as the year 321; but however this may be, it is certain that spots were seen in Europe in the year 807 with the unassisted eye, and have frequently been so observed, either when the sun was near the horizon or obscured by a thin sky-fog.

To the astronomers Fabricius, Galileo, and Scheiner, however, belongs the credit of having been the first to examine these spots under the telescope, and by their help to determine the sun's rotation, and the inclination of the solar equator to the plane of the ecliptic.

The early astronomers were not long before arriving at several interesting facts relative to the disposition and appearance of the dark spots. They perceived that they were generally confined to the equatorial regions of the solar surface, seldom or never being seen out of a zone extending thirty degrees on either side of the equator.

Harriot and Dominique Cassini also lent their powerful minds to the study of the physical nature of the great luminary; and we find the latter philosopher writing, in 1671, in the following terms:

"The solar disc which we see is a luminous ocean surrounding the dark nucleus of the sun. Tumultuous movements taking place in the luminous envelope, enable us from time to time to see the mountain summits of the non-luminous body of the sun itself. When viewed under high optical power, the spots are seen to vary very much in size, from an almost-imperceptible point to chasms and rents of very large dimensions. Neither in size nor shape do they continue constant, but are continually undergoing some change, at one time breaking up and dividing into two or three separate parts, at another uniting, and forming one gigantic chasm."

The spots, moreover, present three gradations or shades of darkness—first, the nucleus, as it is termed, which is perfectly black, and is most probably the actual dark body of the sun, seen through the disrupted photosphere, or luminous envelope. Surrounding the nucleus, is a lighter shade, or penumbra; but, in addition to the nucleus and penumbra, a still darker spot has been discovered, situated within the nucleus; or, more correctly speaking, no doubt, is the nucleus proper.

Recent observations have shown that the penumbra and nucleus rotate round this blacker central spot. From this and other facts, we might state, as the sum and substance of our knowledge of the physical condition of the sun, that it consists of a body, or nucleus, surrounded by a luminous atmosphere, which atmosphere is subject to violent currents and eddies, allowing the darker nucleus

to be occasionally seen, with more or less distinctness, through the disrupted photosphere.

Of the enormous magnitude of these caverns, as we may term them, in the sun's luminous covering, we may gather some idea from the following facts:

"A single second of angular measure, as seen from the earth, corresponds on the sun's disc to 461 miles; and a circle of this diameter—viz., nearly 167,000 square miles—is the least space distinctly discernible on the sun as a visible area; and spots whose diameter cannot be less than 45,000 miles have altogether closed up in less than six weeks. Again, a spot which was carefully measured at the Observatory at the Cape of Good Hope, was found to be of such a magnitude that, if a globe the size of our earth had been thrown into it, there would still have been an unoccupied space of more than 970 miles on either side!"

Is it surprising, then, that we should ask, Is the outbreak of these spots, or their absence, connected in any way with the phenomena of our atmosphere? This question is the more interesting from the fact of the extreme variability of the number and size of the spots, on some days being very numerous, and on others the surface is observed to be nearly or entirely free from them. Scientific men have suggested that there exists a certain relation between the phenomena of terrestrial magnetism and solar spots, and that this relationship is plainly indicated by the movements of the declination-magnet. However this may be, it is not our purpose at present to investigate its magnetic influence, but rather to test the opinion that the weather is affected by the appearances we have described.

On looking over the papers containing our observations on this head, we find that during the years 1847, 1848, 1849, 1858, and 1859, there was no instance of a single day on which observations were made (and they were made on every possible occasion) being free from spots. Let us see what were the general meteorological characteristics of these years: The rainfall for the year 1847 was 18 inches, and the mean temperature 49.7 deg.; that for 1848 was 30.2 inches, and 50.2 deg.; for 1849, 23.9 inches, and 49.9 deg.; for 1858 it was 17.8 inches, and 49.2 deg.; and in 1859 the results were 25.9 inches, and 50.7 deg. mean temperature. Here the rainfall varies from the very small amount of 17.8 inches to the large one of 30.2 inches, being as much below the average in the one instance as it is above it in the other. The rain, therefore, tells us nothing.

The temperature appears to be more constant, the greatest difference in the instances we have given amounting to only a degree and a half.

We will now turn to the years during which the sun's surface has been free from spots for a large number of days; and of this character were the dates 1855 and 1856, in a marked degree. The rainfall for 1855 was 21.1 inches, and the mean temperature for the same period was 47.0 deg.; for 1856 the readings were 22.2 inches, and 48.8 deg.

It would seem from these results that the sun exerted more power, or, at all events, that we received more of its heat, when these spots appeared in the greatest abundance—an observation that would be borne out in the present year.

THE TALLOW TRADE.

The tallow market is one of those fields for speculation where large amounts are lost and won; but there is a lull at present in the state of affairs, and many a heavy brow is met with at "The Baltic" and in Broad-street. There is a dull market, with large stocks on hand and prices without animation, while none can prognosticate or build upon the future as regards either Continental or American affairs. Petersburg yellow candle is 13s. below the prices current in 1859, and town tallow equally flat. No doubt many a shipper and broker looks back longingly at the high prices at the close of 1860, although "distance" does not "lend enchantment to the view." We, however, who can look on unmoved, heedless of the fluctuations of prices, and unaffected by the heavy stocks in store, may improve the occasion by a few remarks on the course of the tallow trade, for the information of those outside of the narrow market circle.

Although it can no longer be said there is "nothing like tallow" for lathering our bristles or cleansing our paws, yet the large and steady imports show that it is still in request, and not yet entirely superseded by all those innovators, whom science and commerce have introduced to supplant it in the notice of the manufacturer.

Of our own production we have no certain data, but it is known to be large, as a glance at our fat cattle slaughtered would show. So far back as 1836 Mr. James Macqueen, in his "Statistics of the British Empire," estimated the tallow yearly obtained from cattle and sheep slaughtered at home at 100,000 tons, of the value of 4½ millions sterling. We then imported 50,000 tons of foreign tallow. If the estimate was at all near the mark at that time, it certainly must be fully sustained now, when with not much larger foreign imports of tallow the wants of our manufacturers are much greater.

From the year 1752 to 1766 the whole export of tallow from St. Petersburg to Great Britain was not 900 tons in the fourteen years. In 1808 the export from the Baltic and Archangel, not including Courland, amounted to 34,500 tons, nearly equal in value to two millions sterling, including freight, insurance, and charges. The annual average quantity of tallow imported into Great Britain from all parts of the world in the twenty-five years 1788-1812, was 842,800 cwt. In 1814 the value of the tallow imported at the high prices of 77s. to 110s., was £681,833; in 1825, at much lower prices, it was £1,180,205; in 1860 it exceeded £3,000,000. Although the largest quantity comes from the northern ports, we get a good deal through the Black Sea.

In a country like Southern Russia, where the greatest part of the land is yet untilled, and the population by no means numerous, pasturage of course abounds, and the breeding of cattle must necessarily be very profitable. The inhabitants are, in fact, always engaged in this branch of industry. England was the first to perceive the immense advantages that could be drawn from the tallow of Southern Russia, and to give an impulse to this trade. In 1814 the value of tallow imported from Odessa was only £12,000: now it averages nearly £800,000. During the five years ending with 1851, we received on the average 120,000 cwt. annually, from the southern ports of Russia. Even the lowest classes of the population have a considerable interest in the tallow trade; for the agriculturists there use oxen for the purposes of draught, and derive a further considerable profit from them by slaughter, when they are no longer fit for service. It must however

be remembered that an ox employed in draught or labour requires at least six months fattening on grass, to yield any quantity of tallow. The slaughter of the animals at Odessa, Nicolaieff, Kherson, &c., commences in September and continues until November. A cow commonly yields from 90 to 150lbs. of tallow, a bullock 144 to 216lbs., and a sheep 25 to 40lbs. Turkey is a considerable consumer of tallow, for it is there often substituted for butter. In the five years ending with 1860 the average annual export of tallow from Taganrog was 61,821 cwt.

Bessarabia, though very rich in cattle, furnishes but very little tallow for export from the ports of Ismail and Reni, because Austria and the trade of Odessa absorb the whole. The cattle of Bessarabia and Odessa are larger and better fed than those of Wallachia; for the simple reason, that all branches of industry are more backward in the latter country. Taking their size into comparison, Moldavia is richer in horned cattle than Wallachia, which, on the contrary, takes the lead in the number of sheep. In both the principalities the cattle and sheep are bought by dealers, who pasture them throughout the summer, with the view of selling or slaughtering them in the months of August and September. Many of the inhabitants on the Austrian frontier are engaged in the trade.

Taking quinquennial periods, we find that the total and average imports of tallow into the United Kingdom have been as follows, in cwt.:

Five years ending	Total.	Annual average.
1847	5,656,211	1,331,242
1852	6,489,402	1,287,880
1857	5,210,880	1,042,176
1862	6,153,054	1,230,610

These averages, after all, show but a very slight variation in the gross imports, with the exception of the third period, when there were reduced supplies from Russia in 1854 and 1855, owing to our being at war with that country. Looking back for a few years, we find, however, the sources of supply of our foreign tallow changing materially, and we are now less exclusively dependent on Russia than formerly, when the bulk of what we received came from that country.

South America is the second great source of supply, and from the River Plate we now draw 255,000 cwt. annually. This amount is double what we obtained from thence only a few years ago, and might even be much more largely increased, were the demand and prices such as to stimulate shipments. The other countries from whence we get our tallow are chiefly North America, India, and a few places in Europe, such as Prussia, Germany, and Italy. The fluctuations in the chief sources of supply may be seen by the following comparison:

From whence.	1853.	1860.	1862.
	Cwt.	Cwt.	Cwt.
Russia	845,902	1,082,663	438,382
Australia	125,186	12,005	104,580
South America	162,443	146,961	253,487
Other countries	42,223	188,479	306,798
Total	1,175,754	1,430,108	1,103,247

From Australia our supplies of tallow vary greatly with the price of stock there and the demand for meat. In some years, when boiling down is extensively resorted to, the

supplies of tallow are large. Thus in 1850 and 1851 we received from thence each year 174,000 cwt., in 1852 159,000 cwt., in 1853 125,186 cwt., in 1857 74,555 cwt., in the next two years only an average of 13,000 cwt. In succeeding years it increased to 66,621 cwt. in 1861, and 104,580 cwt. in 1862. This year we have already received 7,230 casks, against 9,343 casks at the corresponding period last year. Such supplies may no doubt always be depended upon from Australia; but the increase of soap and candle manufactories in the colonies will lead to an enlarged local consumption.

From the United States we have lately been receiving increased supplies. In 1857 we imported 41,587 cwt. from North America, in 1858 and '59 an average of 17,000 cwt.; in 1860 it sprang up to 123,267 cwt., and

in 1861 increased to 264,000 cwt. It approximates in value to South American tallow, according to quality.

The consumption of candles has been lately interfered with by the introduction of refined petroleum from America. The exports from America to Europe last year amounted to 258,000 barrels, or nearly 11,000,000 gallons; and large as this trade has already become, it may be considered still in its infancy. The imports of the vegetable oils, which have so much taken the place of tallow for soap and candle making and lubrication, have also largely increased. The imports of palm oil and cocoa-nut oil in the last three years have averaged 46,000 tons—more than double the import of 1846, notwithstanding the high ruling prices—and an increase of about 8,000 tons even in five years.

STEAM CULTURE MECHANICS.

Short-lived animals and vegetables soon arrive at maturity of growth, while the reverse of this natural law is the case with long-lived ones, and in the inanimate world are to be found many similar examples. The steam-horse furnishes a very striking illustration of the principle involved; for, like the elephant and the oak, he has been long in attaining to a ripeness of age fit for being harnessed and yoked to the plough. But, however slowly may have been the development of the several members of his body, he is now successfully at work in the field, triumphing over all the many stubborn difficulties experienced in the cultivation of land.

Perhaps no record of the past, as regards implements of husbandry, affords a more interesting field of study than the early history of the steam-plough. When the pioneering hand of invention first laid hold on steam as a motion-power, all eyes were immediately turned to the cultivation of land as the principal field of profitable employment. At that time few thought so rude and blustering a customer as the steam-horse was ever capable of being so tamed and trained as to perform the numberless "nick-nacks" which he is now doing in the manufacturing world; and yet it has so happened that the spinning-wheel, the reel and the weaver's loom, of all departments of industry the most unlooked for—because, in the estimation of the times, the least wanted, owing to the number of fair fingers therein employed—was to be the first at which his motive energies were to be applied, and that the cultivation of land was to be the very last in which he was to exemplify his wonderful adaptation of power; and yet such are the realised facts of the case—women's work, as it were, being thus preferred to man's by the steam-horse.

The conclusions arrived at in the opening chapter of the steam-horse were natural, and fully borne out by the experience of the period—the cultivation of land being then a wider and more inviting field of employment than the manufacture of its produce. And, even at the present day, the opposite conclusion is very problematical, however supported it may be by the experience of the past, for it is impossible to divine the amount of service steam may ultimately render the agriculturist. And if this is true as regards the British soil, how infinitely more so is it when we extend our inquiries to tropical and other climates that stand much more in need of the untiring energies of the steam-horse in the cultivation of land, and the husbandry of its produce in its preparation for market!

One of the chief retarding causes to the progress of steam-culture has doubtless been the very wide diversity of opinion that has existed relative to the problem as to how the steam-horse should be harnessed; and, even at the

present time, this is far from a settled question. Our observations in this series of papers have been exclusively confined to those systems involving the hauling of implements by means of ropes or chains, and our reason for so doing was to avoid a vast amount of speculative inquiry that yet surrounds the other systems. To the latter, however, our attention has been solicitously turned by some very eminent engineers, whose experience and judgment have long commanded respect, and therefore we may offer a short series of papers with a view to point out the cause of failures, and how far certain shortcomings may be obviated.

In giving a brief summary of what has been said on the different rope-systems now in the field, it has been shown that modern successes are due more to the wire-rope than to any other part, and that too little credit is being given to it for the triumphs now attained in the field. Had the steel wire-rope, for example, upon which so much depends, been the discovery of any of those inventors now engaged in perfecting its application, it would have formed the subject of a very valuable patent, and on that account would have found many ardent admirers; but the fact of the discovery being now public property does not in the slightest degree reduce its mechanical merits or enhance the value of the other parts of the system when examined in comparison with it. In point of fact, the contrary has been shown to be true. Heathcoat's and Osborn's hauling apparatus and M'Rae's steam plough being, as far as sound mechanical principles are concerned, equal, if not superior, to any now in the field.

The practical conclusion, therefore, as to the wire-rope is to improve its metallurgy, and reduce the wear-and-tear upon it in the field to a minimum.

As to the former of these advances in the march of improvement, no little progress is now being made in the manufacture of iron and its various compounds, so that patentees in this branch of industry will readily perceive that there are more open doors than one for a paying patent. With the agriculturist it is a matter-of-fact question, whose solution in the field will soon decide as to whether this or that rope lasts the longest and performs the most work. Wire-rope manufacturers cannot fail to observe that the rope forms a part of the system so entirely independent of the others as to be a distinct and separate subject of commerce, and consequently that farmers can be supplied directly from the manufactory should any attempt be made by monopolising and grasping parties to deny to trade its legitimate rights. And on the other hand, as farmers acquire experience in steam culture, they will also learn to select what best suits themselves, not

only as to the best quality of wire-rope, but also the other divisions of the system, as the engine, the windlass, and implements best adapted for their soils and pecuniary or other circumstances.

As to the other conclusions—that of a minimum strain upon the rope, tear and wear, and uniform degree of tension—we have unwillingly been forced to the opposite as the rule, viz., *the more mischief to the hauling-tackle the better!* It, no doubt, belongs to the beautiful in theory to make steam and the wire rope do everything, and the homespun rustics with whom our rural provinces are still so familiar do just next to nothing; but quietly looking at the facts of the case, pecuniary and mechanical, as exemplified before us in the field, we are naturally prompted to ask, “*Is this sound practice?*” And unquestionably the pockets of the farmer return a negative answer to this interrogatory. Had the anchormen of Heathcoat and M’Rae applied their levers to the traces of the steam-horse to work forward the anchor, instead of to the anchor-tackle itself, what would their employers, the fathers of steam cultivation, have said? or rather, perhaps, more practically speaking, what would they have done? And the upshot is obviously a well-merited castigation with the whip for an attempt prematurely or otherwise to break the rope; and yet, however strangely queer it may seem, this is nevertheless virtually the practical conclusion involved in “self-moving anchors,” “counterpoise action,” and the other mechanical anomalies of modern times, for in all these it has been shown that “the brunt of the battle” has to be borne by the rope. In other words, the wire rope is being subjected to an extra amount of tear and wear in working clip drums, anchors, friction-wheels, counterpoise implements, &c., as compared with the systems of Heathcoat, M’Rae, and Osborn, and which, therefore, could easily be avoided, and which doubtless will be obviated as soon as the merits of the latter systems are properly understood and appreciated by the agricultural public.

The conclusion thus arrived at amounts to a sweeping censure upon our own times; and the only qualification that can be given it arises from the consideration that Heathcoat, M’Rae, Osborn, and our other early pioneers in steam culture, were obliged to reduce the strain upon their hauling tackle for other reasons than those involved in the censure thus pronounced—the resistance arising from weight, friction, and less perfectly-constructed mechanism being fully enough for steam as a motive power to overcome, apart from the extra work of moving anchors, &c.: so that, it may be argued, “if they had been in possession of steel-wire ropes, it is just possible they might also have fallen into the break-rope system of the present day.” But making the most of this, it rather, we fear, amounts to an apology for fallen humanity than the justification of a departure from sound mechanical principles in the use of the wire rope.

With farmers the practical conclusion ought to be to make their different forces pull together in the performance of the work. In other words, they have to make the most of their men, of the engine, implement, and anchor, as well as of their steam engines, by every improved mechanical appliance; but to devise mechanical means for making the steam-horse break his traces alike at the engine, implement, and anchor, in order that the former may have the pleasure, as it were, of exercising their organs of vision in their true rustic simplicity in beholding such mischief done, more resembles the conduct of the Roman Emperor Nero, who “fiddled while Rome was burning,” than improving the application of the wire-rope in steam culture. Give the engineer, the ploughman, and the anchor-man every advantage possible in mechanical improvement, so as to enable them to perform more work; but such is the very reverse of idleness; for if improved

mechanism does not enable workmen to give the farmer more labour for his money, it ceases to confer any advantage to him. But, as will be shown in its proper place, the application of the professional skill and muscular powers of the men is a subject totally different from that of the application of the wire-rope in hauling the steam-plough, and instead of making progress in the latter, our modern inventors are, we repeat, moving in the opposite direction! And what makes this all the more to be regretted, is the fact that as practical agriculturists, we are now being called upon to land those the most who are moving the fastest in this retrograde line of action! When examined from a mechanical point of view, every branch of the subject must be investigated in its own light, and the economy of the wire-rope is no exception to this rule.

With regard to anchorage, the conclusion arrived at was, that the principles involved in the practice of Heathcoat, M’Rae, and Osborn were sound, and far preferable to those of the pseudo-self-moving anchors of the present period. If the man at the anchor can work it forward by a winch or hand spoke the proper distance during the time the implement is traversing a short land’s length, as he can easily do, on any of the many old plans proposed and carried out, it is, to say the least of it, a penny wise and pound foolish economy to pay for complicated machinery to do it, at the expense of an extra cost for steam and rope, and that too without the reduction of a single farthing in the cost of manual labour; and besides the prodigal waste of steam, rope, and machinery in the other branches of the system, confining our observations to the anchor alone, the work was much better performed by Heathcoat and M’Rae than is now being done. When actuated by a winch, the man can work forward his anchor the proper distance required to a hair’s-breadth every shift, and this is more than has yet been done or can be done by any self-moving system of anchorage; and this is not all, for anchors not only can be worked better and more economically by muscular power than by steam, but also with far less injury to the head lands than under any of our modern systems of anchorage.

We now come to mechanisms for actuating the rope, viz., the different kinds of windlasses; and here, again, our conclusions legitimately arrived at were, we regret to say, not in favour of the present day. All questions of merit that had a shadow of modern opinion in their favour were left open ones for solution at the bar of future practice; but even when done, the winding-drum systems of Heathcoat and Osborn have not yet been superseded by any of greater merit either as to the shortness of the length of rope required, or to the minimum strain upon it in ploughing an acre of land to any given depth. So far, therefore, as the principle of mechanism is concerned, it cannot be said that we have made any practical or scientific progress. That improvements are being made in the construction, and that a finer quality of workmanship is thus in operation in the field, will readily be granted; but this is a totally different question from the principle of mechanism—one which will subsequently be disposed of, and which we may here observe, in passing, is greatly in favour of Heathcoat, M’Rae, and Osborn, and not against them. This is a difference which ought never to be lost sight of in examining the progress of sound mechanical principles as exemplified in the history of the steam-plough. And the conclusion thus arrived at, it must also be observed, is much more in favour of the future than the past. To the opinionative and superficial observer, who can only see things in a selfish or party-personal light, this comparison of the past and future may appear somewhat paradoxical, but our real mechanical pioneers in the cause of steam-culture progress will see them in a very different light, for Heathcoat’s and Osborn’s patented discoveries are now public property, and subject to vast improvements,

so that the more retrograde the present current of invention, and the farther the pseudo-fathers of the steam-plough are from the right line of direction, just so much clearer is the horizon from patent-law clouds, and wider the field around for improving the hauling apparatus in question.

Of the direct and indirect systems of rope traction, comparatively nothing requires to be said by way of conclusion. The merits of the former have, we are glad again to say, recently been practically raised in the field by the Messrs. Coleman and Sons, and there cannot be a doubt but the mechanical principles in its favour will ultimately procure for it a complete triumph over the indirect system of haulage. Although from the earliest period a favourite mode of rope traction, the direct system has never yet been fairly tested in the field, and the winding drums of the above Chelmsford firm have by far too small a diameter to do it justice. In addition to Osborn's patent, formerly mentioned, those of Clarke, Freeman, and Varley, No. 11,077, A.D. 1846, and Sir John Scott Lillie, No. 11,907, A.D. 1847, also merit a special notice, as including direct haulage; so that the principle is now public property under several old patents, and open to improvement in various ways.

The steam plough affords room for a more lengthy summary of mechanical appliances to overcome the stubborn resistance of the soil. In point of mechanism McRae's implement, manufactured at Glasgow in 1840, and successfully tried on the lands of Possil in the neighbourhood, and worked upon the inventor's own estate in Demerara, to which it was shipped, is to this day without a rival as to principle. As the soundness of this conclusion is about to be verified in the field, we have studiously avoided saying more in favour of the Glasgow steam plough than is necessary merely to turn attention to the facts of the case, which will eventually speak for themselves. But apart from its merits and simplicity of mechanism altogether, it was shown that the "see-saw movement," or "counterpoise action" of the up-ploughs now in operation is a step in the wrong direction, and also the fixing of the ploughs together in sets, on the old objectionable plan so warmly advocated about the commencement of the present century by Lord Somerville, in his "*Tracts on Sheep, Ploughs, and Oren.*" His lordship was a patentee, and of course as such had a licence to praise the hobby-horse on which he rode; but objectionable principles of mechanism

that have been condemned by the more intelligent practical agriculturists of every age, including the present time, as regards the construction of horse-ploughs, cannot be otherwise under steam culture. In the construction of the modern "see-saw," or "pseudo-balance ploughs," including the implements of Fiaken, Fowler, Chandler and Oliver, the Howards, &c., &c., there is thus a twofold departure from sound mechanical principles, that cannot under any circumstances be approved of by the more talented and better informed of the agricultural body, especially the few who saw the Glasgow implement at work, or have conversed with those who were eye-witnesses of its success; for in either case they can appreciate sound principles of mechanism, and reject what are otherwise.

In thus pointing out the shortcomings of our present steam ploughs, with a view to stimulate the manufacture of others on sounder principles, we have carefully avoided hiding a single flaw relative to the Glasgow implement. In point of fact, we have purposely adopted the contrary line of argument, by saying less in favour of the latter than we might have done, under the well-known maxim that the less perfect a principle is carried out by a patentee, there is the better chance at the expiry of his patent for talented inventors profiting by its improvement. In this direction, therefore, we are ready to concede to our readers as much as they may desire; for, granting, for the sake of argument, that the Messrs. Thomas Edington and Sons, of the Phoenix Iron Works, Glasgow, made a Scotch bungle of McRae's proposition in 1840—and this is conceding far more than the most enthusiastic disciple of the pseudo-balance school can ask—just so much the brighter are the prospects of the future.

Our chief claims to progress, therefore, rest upon the wire-rope and a greatly superior quality of workmanship in the construction of engines, windlasses, and implements. Of the advances made in the quality of machinery, it would be superfluous to make any comparison between the past and present, so greatly are the odds in favour of the latter. This, therefore, is very encouraging to those who contemplate carrying out improvements of Heathcoat's, Osborn's, and McRae's systems, and who in point of fact have already virtually given orders for their manufacture in England, and we could point out to more than one Scotch firm that will not be behind in the enterprise.

ENGINEER.

DAIRY PRODUCE AND MANAGEMENT.

A PAPER LATELY READ BY MR. HORN AT THE EYE FARMERS' CLUB.

Mr. Chairman and gentlemen, the subject which I have undertaken to bring under your notice this evening is one on which we may expect a very interesting and instructive discussion. We are familiar with dairy produce, whether in the shape of veal, milk, cream and butter, or cheese; therefore, gentlemen, I wish it distinctly to be understood that it is not my intention to give you a lecture on what your systems of management ought to be, but to submit a question for discussion in which I hope many of you will join. Milk in its pure or manufactured state has been used by man from time immemorial; for we are informed in Scripture that Abraham entertained his supernatural visitors (when on their way to warn Lot of his impending danger) with milk, butter, and what we now term veal. Also as an inducement, the Israelites were told that Canaan "flowed with milk and honey." Or if we turn to the wandering tribes of the present day, we

find the Arab rears his camel as a beast of burden and for the production of milk; so, likewise, the Laplander his reindeer for a similar purpose. Again, if we travel through the rocky mountains of Siberia, we find the goat held in esteem for its milking properties. But in all civilized and cultivated countries these animals give place to the cow; therefore it is the cow, her breed, feed, and management, that we have this evening met to discuss; and I may add a very important branch of rural economy, not only as a matter of pounds, shillings, and pence, but I presume there are few present who do not relish dairy produce in some shape or form; therefore, gentlemen, I will crave your indulgence whilst I attempt to give a short outline as to the breed of cows best adapted for dairy purposes. It will be within our province this evening to review only those most especially that belong to the class of dairy cows, which we may classify as follows—the

Yorkshire, Ayrshire, Alderney, and Suffolk. The Yorkshire being the largest and most numerous, we shall therefore take her first. The Yorkshire cow, as we term her, is descended from the Holderness crossed with the Durham bull, but a different animal to the Teeswater or high-bred shorthorn. They are held in high estimation in and around London for the quantity of milk they yield; and, if well kept, at the same time making flesh for the butcher. An average cow of this breed, for several months after calving, yields 20 quarts a day; while some have been known to yield from 30 to 40 for months together. Some cows are supposed to yield from 4,000 to 5,000 during the year. It must be borne in mind that the food is of the most forcing description for the production of milk, without regard to quality—brewers' grains being a *sine qua non*. These cows form all the dairies of the Midland Counties; their milk is not rich in cream, yet on rich pastures or high feeding this is more than counterbalanced in quantity, and making beef at the same time, as we have the testimony of Mr. Horsfall, Braley Hall, Yorkshire, who so explicitly described his mode of management in his papers to the Royal Society's Journal—papers which I would strongly recommend a very one interested in dairy management to peruse carefully. I must next advert to the Ayrshire; and I believe, taken as a breed, they are the most select as to milking properties. Ayrshire being a dairy county, the breed has been cultivated with the greatest care, and selected by distinguishing points known only to the initiated; and I hesitate not to state that we have no other class of cows, taken as a breed, that will produce the quantity of milk for food consumed. Hence the high estimation they are held in cheese-making districts. I shall give you one illustration. We have one small cow in our dairy (of said breed) which is called Victoria, now well up in her teens for one season (pasture in the meadows only); for three months she averaged 26 quarts a day. We have records of much greater quantities than this, but she was a small cow, then only about 56 stones imperial live weight; so that every 27 or 28 days she produced her entire weight in milk; in short, she may be termed a milking machine. Even now, when in full profit, her bag seems as large as her body. I now come to the Alderney or Channel Island cows, which in their own island are most valuable, both for the quantity and quality of butter they produce. They are not much in favour in the eastern counties, in consequence of the high prices which have to be paid for them when in profit, and their comparative small value to the butcher; and, moreover, our sharp east winds rather tell on their delicate constitution. When kept, it is mostly by private gentlemen for family use. They yield a fair quantity of milk, which is very rich in cream, and produces excellent butter. In their own island they are reported to yield from 10 to 12 lbs. of butter a week during the summer; that result is very seldom obtained in this district, unless under very favourable circumstances. In the West of England they are greater favourites than with us. However, W. Fisher Hobbs, Esq., of Borted Lodge, has favoured me with the following account of two cows kept by him of the same breed. He writes as follows:—"At your request I send you a correct account of the produce of two cows (Alderneys) which I kept at my own residence, Borted Lodge, in 1861. I had no other cows there during that time. You will observe that the produce from these two cows was kept separate, from the period of their calving until the 12th of July. After that time the cream was mixed. The total produce of these cows in 34 weeks was 860 lbs., besides what cream was used in my house; this being an average of 25½ lbs. for the two cows during the 34 weeks. You will observe Mr. Hobbs states that the milk

was kept separate from the period of calving until the 12th of July. For 14 weeks previous to the date, one cow averaged 17½ lbs., and one week 20 lbs. 1 oz.—a quantity (for the length of time, be it remarked) I am not aware has ever been obtained from a cow of any other breed. So much for the Alderneys. We shall now briefly refer to the Suffolk. There are many gentlemen in this room who are better qualified to give an account of the Suffolk cow than I am, from the short period that I have been amongst them, and I shall be glad to hear them this evening. However, we have records of a polled breed of cattle in Suffolk for about 200 years, but of what shape or form we are left to surmise. In my opinion, at no distant period they have been crossed with the old Aberdeens, to which the best animals of the present day bear a striking resemblance. Blood red is now the favourite colour, with little or no white, unless the tips of the tails; but they have been so indiscriminately crossed, latterly, with all sorts of brutes which could be called bulls, that in consequence we have nearly lost the original stock. In short, since the dispersion of the late Sir E. Kerrison's stock, it has been difficult in this district to find pure animals to breed from; and I wish to impress upon my dairying friends that it is just as essential, in order to obtain good milkers, that the male should be descended from as good milking stock as the female. Most people are careful as to the milking properties of the cow they breed from for the dairy, but the bull is seldom taken into consideration; and it somewhat surprises me, considering the haphazard manner in which they have been bred, how the Suffolk cows have still kept the milking properties for which they are justly celebrated. We have obtained 24 quarts a day from a Suffolk cow when in full profit, and I presume my dairying friends will not term them useful unless they yield from 18 to 20 quarts a day when in full profit. They are better adapted for the arid climate, rough and badly-farmed pastures of the eastern counties, than any other breed. They yield a good quantity of milk; and when properly fed, their milk is pretty rich in butter. Taken as a breed, their skins are coarser than either the shorthorn or Ayrshire; in consequence, they are not so sensitive of flies; and, moreover, being without horns, they are more suitable when in yards. Likewise they are favourites with the Society for the Prevention of Cruelty to Animals, as they cannot inflict severe torture on each other; and when crossed with a proper shorthorn bull, produce a good animal for fattening purposes. And, further, we have the testimony of Mrs. Rainer, Thorpe, confirmed by other eye-witnesses, of her polled cow producing in one week 19 lbs. 15 oz. of butter, and for weeks in succession 18 lbs. 12 oz., and for nine months 11 lbs. 4 oz. was the average. Mrs. Rainer had only this one cow; but, to use her own words, she "treated her like a child." Again, we have the late Mr. Lingwood's cow, at Brome, which produced 16 lbs. 4 oz. in one week, and for weeks averaged 15 lbs. She was also a single cow, kept by a private gentleman. The late Mr. Pusey truly said, "Books will not teach farming; but if they describe the practices of the best farmers, they will make men think, and show when to learn it." Acting on this motto, I shall read you a few extracts from J. C. Morton's "Hand Book on Dairy Husbandry," an author to whom English agriculture is much indebted. The yield of milk, Mr. Morton truly states, is the first point to which attention is directed on any review of dairy statistics. The first case given by Mr. M. is that of Mr. Telfer's neat Ayr, where his dairy of 47 Ayrshire cows produced annually 650 gallons each. The next is that of Mr. Buttery's, Calder Bank, whose dairy of 30 cows, same breed, produced 632 gallons. Then, further,

he gives reports of Yorkshire cows, as Messrs. Wright of Surrey, and Crawley of Cheshire. Mr. Wright's average is given as 810 gallons, and Crawley's as 866. Three out of the four it has been my privilege to inspect. The cows were kept on the most forcing food, soiled mostly during the summer on Italian rye-grass, with other extras in addition. One more quotation as a maximum—extending even these of little use for statistical purposes, but showing what can be done under good management—the case of Mr. Cramp's cow, authenticated by the Board of Agriculture, and since published in most books on dairy husbandry. Mr. Cramp was keeper of the Lewes jail in the early part of this century, and we gather from the reports of his cow, from 1805 to 1812, that during the eight years she yielded 9,720 gallons of milk, or 1,200 annually, being an average of 13 quarts a day for the eight years. She was fed on grains all the year round, from a bushel in winter, to half a bushel in summer, each day, with clover, lucerne, carrots, and bran, what she could consume; and, moreover, the milk produced 4,259 lbs. of butter during the eight years, which is something like 10 lbs. weekly: this is quantity and quality with a vengeance. Having now given an outline of the produce of different breeds of cows, we must next proceed to analyse the systems of converting the produce into money. The most profitable is when the milk can be sold sweet from the cow, which in most localities will sell for about 8d. per gallon; and if we take the general average of the Yorkshire cow, when well kept, as being about 800 gallons, then we find the produce will amount to something like £26 annually. In turning to our own country cows, they, on an average, may be supposed to yield 500 gallons, being about two gallons a-day for nine months. Supposing these 500 gallons to be sold at 1½d. per quart, we would then realise about £16 10s., with calf 10s., would make the result £17 per cow. When the milk cannot be sold, we must then convert the 500 gallons into cheese; then we should realise something over 500 lbs. of cheese, which at 6d. per lb. gives £12 10s.; calf and whey for pigs 30s., would make £14 per cow. By converting the cream into butter and the partly-skimmed milk into cheese, we would then realise 160 lbs. of good butter at 1s. and 300 lbs. of part skim milk cheese at 4d. per lb., which, with calf and whey at 30s., stands at £14 10s., and, with proper management producing a good article, the price of produce may be raised, and these terms may be exceeded. We shall now find how this tallies with other districts. In Dorset and some parts of Somerset it is customary for dairymen to rent the cows from the farmer, the dairyman doing all labour, and the farmer providing cows and keep, for which the former pays for produce of cows £9 10s. to £10 10s. The produce is mostly converted into butter and skim-milk cheese in Dorset; while in Somerset, some of the best Cheddar cheese is made now worth 9d. per lb. A similar system prevails in the West of Scotland, but the produce is entirely converted into cheese, the cows are better kept, and the rents are higher, both to the farmer and dairyman. A late employer of mine rented a farm in the said district of 600 acres, his rent being £1,200. He kept a dairy of 100 cows; and I have known his dairyman pay £12 for each cow, which covered the farmer's rent. The agreement was—the dairyman to do all labour attending the cows, unless some milking the farmer had to provide. Keep of cows was 1½ acres for each cow, of good grass for summer; six tons of swedes and two bushels of bean meal for each cow, with straw *ad libitum*. The dairyman would realise about 4½ cwt. of cheese from each cow, and when properly manufactured would sell about 70s. per cwt. The produce would run from 14 lbs. to 15 lbs. per cow. I have thus,

gentlemen, endeavoured to bring under your notice the different systems that are practised in other districts. I have stated results which have been and may be realised with proper management, and one naturally begins to wonder why Suffolk, once so prominent in dairy management, is now getting into the shade; the complaints are loud and long that no dairy-maids are to be found. Again, some MAIDS maintain that there are no places for them to learn, as no one will take the trouble to teach them. *But they are not easily taught who don't want to learn*; and as crinolines and feathered caps are more in unison with nursery-maids, table-maids, and house-maids, the washing, scrubbing, working, rosy-cheeked dairy-maid of old is nowhere to be found; so if the dairy is left to the maid, the maid must have the boy to do it; and if left to the boy, to use a popular phrase, it soon must go to the dogs. We are told that cleanliness is next to godliness; and in no case is it more applicable than in dairy management. Morning and evening, Sunday and Saturday, twice a day the dairy must be attended to; for, be it remembered, it is only a first-class article which commands attention in the market. We now come to the last branch of our subject, and one on which I doubt not all of you are familiar—converting the cream into butter; a very simple, but at certain seasons, with certain feeding, a very ticklish operation to make a first-class article. As we make a middling article, I shall give you an outline of the system we pursue. During the winter our cows are fed on roots and chaff in conjunction: the first part of the season on Scotch yellow turnips or swedes: after Christmas on mangolds. These in fall profit receive about 4 lbs. to 5 lbs. of cake or corn in addition. It is when fed on roots that the care and experience of the dairy-maid are put to the test to produce a good article. Our dairy people maintain that if we send the milk into the dairy free from taint, they will produce butter agreeable to the palate; therefore, when the cows are on roots we invariably use a small quantity of saltpetre put into the milk *from the cow*, in order to dispel any effluvia the roots may produce. Care must be taken not to use too much; if so the butter will taste rancid; say an ounce to every 30 gallons. We shall now go into the dairy, and, to use an Irishism, we don't allow the butter to spoil before it is made; that is, stale vessels taint the milk, or stale milk taints the cream, and tainted cream will not produce first-class butter; and as our object is quality before quantity, our customers being rather fastidious in taste, we must endeavour to produce a sweet article. The milk is first creamed at 24 hours, and again at 36; in so doing, both milk and cream keep sweeter than if only once creamed at 36. We churn thrice a week. We use no artificial colouring. Our spare butter goes to a "west-end miss," at prices varying from 14d. to 17d. per lb. There are many *ifs* and *ands* in order to make good butter when cows are fed on roots; but the dairymaid claims them as her knowledge of the art, and which would be tedious to describe. Gentlemen's dairies are in unison with "home farms." Neither are proverbial for large profits. However, while our injunctions are to produce a first-class article, we at the same time have an eye to profit. Our dairy of milk cows are 24, and they cost us for dairying and attendance 21s., or 1s. a-head per week; and on examining our dairy book for 1863, after deducting said labour, I find a credit of £10 standing for each cow. Be it remembered, we wean a calf for each cow in addition. In the foregoing observations I have endeavoured to bring under your notice the breeds of cows best adapted for dairy purposes: thus we find the Yorkshire the favourite, where pastures are rich and quantity required. And again, in the western part

of our island, where cheese-making prevails, we find the Ayrshire the universal favourite; and when only cream and butter are required, we find the Alderney in esteem. It is said Ireland for the *Irish*, and we must say "the Suffolk cow for Suffolk," for, after a trial of all the breeds I have named, it is found by experiment in our establishment that they are the cows best adapted for the district. I have likewise brought under your notice some maximum to look forward to, as the case of Mr. Cramp's cow, our own small Ayrshire, Mr. Hobbs' Alderney, Mrs. Rainer's "home-bred," and Mr. Lingwood's red Suffolk; except our own, they were all single cows, and received no doubt more care and better keep, in conjunction with good management in the dairy, than are generally bestowed. I have given the results and general profits in other districts. I have also stated how we succeed in our own establishment. There is no doubt many of you have exceeded our small profits; but it may be equally true on some farms, for want of care and attention in the management of produce and stock, they have not been obtained. And now, in conclusion, I would advise my dairying friends to endeavour to improve our stock of Suffolk cows, and to be a little more careful in the choice and selection of bulls, endeavouring to obtain them from good milking stock. *Even now they are*, and with care and attention they might be made a very valuable animal for the district. I have generally treated the subject with reference to the soil and climate of this country. With more rain, less easterly winds, pastures naturally richer and better farmed, other breeds might be found better suited than the red Polls. But while we can claim the credit of having such cows as those of Rainer's or Lingwood's, we only require the same perseverance and knowledge of points which have been and ever are successfully applied to the raising of our far-famed Suffolk horses, to make the breed of cows equally famous. For while we are very careful to bear in mind sire and dam of a horse, more especially if they can count Royal Duke or Newcastle Captain, any brute from Norwich Hill, having the wherewithal to beget his kind, is considered good enough for Suffolk cows.

SCARBOROUGH AND HACKNESS AGRICULTURAL SOCIETY.

The second show of the Scarborough, Hackness, and North and East Ridings Agricultural Society was recently held at Scarborough. The amount offered in prizes was about £450, Mr. Dent, M.P., the president of the society, giving a silver cup for the best hunter, and Mr. Morritt, M.P., a prize of £5 for the best mare or gelding for harness belong to a freeholder of the North Riding, and the hurdle jumping for the first of these prizes excited great interest. The entries were much larger than last year, the total number being 913 against 712 in 1862; and the stock exhibited in every department was of a character which reflected credit upon the agriculturists of the district.

PRIZES.

CATTLE.—SHORTHORNS.—Bull of any age, 1st, S. Barker, Pockley, Helmsley; 2nd, R. Middlebrough, South Milford. Bull above one and under two years old, 1st, R. Gell, Grimston Lodge; 2nd, R. Middlebrough. Bull calf under twelve months old, 1st, E. Corner, Whitby; 2nd, H. Morley, Melbourne, Pocklington.

Cow or heifer above three years old, in calf or milk, 1st, Lord Feversham, Dancombe Park; 2nd, R. Middlebrough. Heifer, above two but not exceeding three years old, in calf or

milk, 1st and 2nd, Lord Feversham. Heifer not exceeding two years old, 1st, Lord Feversham; 2nd, T. Jolly, Warlaby. Heifer calf, 1st, T. Jolly.

CATTLE OF ANY BREED.—Bull above one and under two years old, 1st, R. Coverley, Brompton. Bull calf under twelve months old, 1st, T. Ferguson; 2nd, A. Jackson, Scalby Lodge.

Cow in calf or milk, above three years old, 1st, H. Morley; 2nd, T. Hornby, Flotmanby. Two dairy cows, 1st, H. Morley; 2nd, R. Rowley, well Dale. Heifer not exceeding three years old, in calf or milk, 1st, J. Elsworth, Yeddingham; 2nd, R. Macfarlane, Seamer. Heifer not exceeding two years old, 1st, J. Elsworth. Heifer calf, T. Swallow, Scarborough. Fat ox, 1st, H. Crompton, Thorne Holme.

LEICESTER OR LONG-WOOLLED SHEEP.—Two-shear or aged ram, 1st, H. Donaldson, Ruston; 2nd, John Borton, Barton-le-street. Shearling ram, 1st, T. Stamper, Oswaldkirk; 2nd, E. Riley, South Dalton. Pen of three shearling rams, 1st, E. Riley; 2nd, J. Borton. Pen of five shearling wethers, 1st, R. Lovell, Knapton; 2nd, J. and E. Tindall, Knapton Hall. Pen of five shearling gimmers, 1st, R. Lovell; 2nd, W. Brown, Holme-on-Spalding-Moor. Pen of five Leicester ewes, T. Shaw, Filey. Pen of ten Leicester summer lambs, R. Lovell. Ram adapted for mountain district, T. Smith, Groomout. Pen of three ewes, adapted for mountain district, N. Barker, Helmsley. Extra sheep stock: Two Leicester ewes, Mr. Wright, Broughton.

PIGS.—Best boar, large breed, 1st, J. Hickman, Hall; 2nd, J. Shaw, Falsgrave. Best sow, large breed, 1st, Mr. Wainman, Carrheads; 2nd, J. Thompson, Seamer. Best boar, small breed, 1st and 2nd, Mr. Wainman. Best sow, small breed, in milk or pig, 1st, Mr. Wainman; 2nd, J. Dyson, Leeds. Best boar, large blood breed, 1st, Mr. Wainman; 2nd, J. Graham, Leeds. Best sow, large blood breed, 1st and 2nd, J. Hickman.

HORSES.—Thoroughbred stallion for hunters, 1st, J. Webster, Allerston Marishes; 2nd, Sir G. Strickland, Boynton Hall. Stallion for coach horses, 1st, M. Johnson, Brigham; 2nd, W. Piercy, Driffeld. Stallion for roadsters, 1st, T. Brown, Butterwick; 2nd, Mrs. Ramsdale. Stallion for agricultural purposes, 1st, W. Simpkin, jun., Burton Agnes; 2nd, W. Billamy, Withernsea. Hunting mare and foal, 1st, H. Lambert, Welton; 2nd, J. Simpson, Hunmanby. Coaching mare and foal, 1st, W. and F. Coulson, Castle Howard; 2nd, E. Robinson, Nafferton. Agricultural mare and foal, 1st, S. W. Duggleby, Cotham; 2nd, G. Lawson, Sherburn. Roadster mare or foal, 1st, F. Rickhill, Pocklington; 2nd, T. Woodall, Seamer. Three years old hunting gelding or filly, 1st, T. Darrell, West Ayton; 2nd, Sir G. Strickland. Three years old coaching gelding or filly, 1st and 2nd, T. Ellerby, Whitwell. Three years old hackney gelding or filly, 1st, W. Brand, Salton; 2nd, W. Goston, Driffeld. Three years old agricultural gelding or filly, 1st, J. Burdass, Thwing; 2nd, T. Hornby, Flotmanby. Two years old hunting gelding or filly, 1st, Sir G. Strickland; 2nd, R. H. Harding, Bellifax. Two years old agricultural gelding or filly, 1st, J. Burdass, Bridlington; 2nd, J. Hodgshun, East Ayton. Two years old roadster gelding or filly, 1st, J. Hardy, Seamer; 2nd, W. Brian, Hunmanby. Two years old coaching gelding or filly, 1st, J. Simpson, Cayton; 2nd, J. Stephenson, Wheelrake. Yearling hunting gelding or filly, 1st, G. Leighton, Osgodby. Yearling agricultural gelding or filly, 1st, J. Simpson, Hunmanby; 2nd, J. Brathwaite, Eberston. Yearling coaching gelding or filly, 1st, F. and W. Coulson, Castle Howard; 2nd, J. Simpson, Cayton. Pair of agricultural horses, either sex, worked during the season, 1st and 2nd, J. Simpson, Hunmanby. Lady's pony, 1st, M. Simpson, Sledmere; 2nd, J. Easingwood, Everingham. Pair of carriage horses, the property of the exhibitor for three months prior to the day of show, and not less than three years old, 1st, Admiral Mitford, Hunmanby; 2nd, J. Robson, Gaston. Hunting mare or gelding, 1st, G. Holmes, Beverley; 2nd, W. Musson, South Holme. Best actioned three, four, or five years old mare or gelding, for harness, not less than 15 hands 2 inches, or above 16 hands, got by a thorough-bred horse, and dam by a thorough-bred horse, 1st, J. Darrel, West Ayton.

UNDER-DRAINING.

FILLING MATERIALS.

If drains are reduced to two articles of acknowledged merit and established utility in stones and tiles, stones are preferable in all cases where the loose materials are found, or can be got from quarries underneath the ground; the ease or difficulty of procuring them, and the near or distant carriage, will determine the eligibility of the articles for use. When broken, as the stones must be, to the size of road-metal, the strongest drain is formed by these materials; and it affords the greatest number of interstitial cavities to the draining power of the land, and to the reception of water. Stones will abound where tiles cannot be formed, by reason of the want of clay; nor imported but at an extravagant cost. Tiles will be procured at an easy rate in alluvial countries where no stones are within reach. In these cases a moment's hesitation is not required: the present article must be used. And the preference comes to be decided between the articles where both are found on something like an equal footing. In these situations the calculation of the expense of each application will occupy the first attention; and next, the value of the article for the special purpose, whether supposed or real. In all executions of which the object has a permanent appearance, the durability of the performance claims a most serious attention, which must not be let slip for one moment from the constant view of the purpose. In most cases tiles are much cheaper than stones; and as carriage is the most laborious part of draining, that item is an important particular for consideration in undertaking the draining of any quantity of land. The tile is a much lighter article than stones, cleaner, and much easier handled in the cartage and placing in the drains: the ratio of 6 to 1 has been found to obtain in the cartage of tiles and stones, and in favour of the former. The cartage of stones is not eligible beyond half-a-mile, or three-quarters at most, which implies the articles to be on the farm or in the close vicinity. Tiles can be brought from a very considerable distance, and are still cheaper than stones; but the stones form the best drain wherever the presence of the article is convenient. Low-land countries and alluvial districts do not afford stones, and tiles must be used, from the clay which generally abounds; higher situations will yield stones, and probably no clay, and there stones must be used, unless tiles are found in the near vicinity.

Tiles are arched as a bridge, or are formed in circular pipes. Both shapes have been much used, and strongly recommended. The pipe-tile is something cheaper, and is more expeditiously applied in use; but the arched-tile of four inches, placed on a sole in the bottom of the drain, is much preferable to a pipe of one-inch bore, in affording a larger cavity, a readier reception to the water that gets access to the drain, and a more ample and commodious duct and discharge to the collected fluid. The arched-tile in itself forms too small a cavity; the pipe-tile is much worse, and soon sinks into a useless opening, when earth is placed over it, which will become compact, and closely cemented over it. If a filling of broken stones or screened gravel is laid over the pipe-tile, the use is better, in its affording a duct for the water, but which will find a way among the stones without any tile at all. For the reason of affording a larger cavity, the arched-tile exceeds the formation of a pipe.

Stones and tiles that are placed in drains, in order to

maintain a cavity in which water finds a passage from the field, are covered by a substance that admits the passage through it into the drain, and prevents any earth from descending and lodging, so as to form an obstruction to the passage of water and air. Straw, and all strawy substances, are much adapted to this purpose; and being of generally convenient supply in most situations, the articles are extensively applied in this employment. A grassy turf of any kind is a most eligible covering for the interstitial fillings of a drain; the upper side being placed upon the tile or stones, the compactness prevents any loose earth getting downward among the stones or tiles, and the very porous composition in animal and vegetable remains very freely allows the water to pass to the drain underneath. Ferns are similar to straw for the purpose now mentioned, but are not often found. The flat branches of the spruce fir tree are a good covering, and may sometimes occur in the drainage of lands that adjoin the manor-park of a landed estate. In high situations, where heaths are found, these plants form a very good covering of the tiles or stones, as the antiseptic quality is durable, derived from the peat-moss, on which the heaths are produced. A moorish turf, of a thickly-matted grassy surface, that has never been broken up or improved, exceeds all other coverings in the matted texture, and a durable, indecomposable quality. The article is worth the carriage of some distance. The interlaced fibres for a long time afford a sort of carpet, which sustains the earth, with sufficient openness to permit the downward passage of water. Straw and turf are the common coverings, as the articles are most generally abundant.

Loose earth, that is dug from the drains and laid on one side of the cavity, is thrown promiscuously over the covering, and raised considerably higher than the solid ground, in order to allow for the sinking of the loose assemblage. The under soil and upper vegetable stratum being mixed in the refilling of the drain, the coherence of any viscous matters is prevented for a long time, and thus affords a ready passage into the drain of the water that flows to the place of reception. The divided masses of the digging will not again reunite into an impervious mass for some time, and the mixture that is made in shovelling the earths into the drain very much assists in forming a porous mass at the top of the drain; the cavity is thus wholly open to water, from the bottom to the extreme top—in the tile or stones, the over-lapped covering, and the earth that is used to make a level surface.

EXECUTION

Of draining claims much attention, in whatever method it may be arranged, being easy to spoil and difficult to remedy. In no agricultural business whatever is more care and attention necessary than in draining, and nowhere does carelessness and neglect operate more forcibly and to greater disadvantage. Work that is exposed to view may be mended when seen to be imperfectly performed, but a drain when covered is hid for ever, and the mischief remains. A neglect even in one single place may defeat the purpose of an entire length of drains, cause obstructions, and incur much expense and labour in removing them. The execution of the work of drainage is equally important with the direction or line of the cavities: it may even occupy the prior position, as the most favourable direction that can be selected may be rendered wholly useless by reason of the cavities being in-

sufficiently excavated, and the filling materials being negligently placed in the drains, carelessly levelled and covered over. The most minute and scrupulous attention is required from the first digging of the surface soil till the earth is replaced over the cavity.

Lands are much the most conveniently drained when in a state of grass, on account of the superior cleanliness and neatness with which the work can be performed. This inestimable advantage will most amply compensate for any additional expense incurred in digging the drains during the hard season of summer, which may sometimes happen, and probably not often occur. The other condition of the land will be in the fallow process for wheat, when the whole summer will be employed in the performance of the drainage. The direction of the drains being marked out by pegs or turves, the grassy turf is pared thinly from the surface of the drain, and laid on one side of the cavity, the earth being placed upon the other. On arable lands, the common plough will in two bouts throw out two heavy furrows to each side of the drain, which will make a depth of eight or ten inches, and much assists the digging of the cavities. The excavation is then done by contract to within six inches of the fixed depth, and left in that condition for the present. The stones having been in the meantime brought forward, and laid alongside the line of drains, are broken to the size of road metal on platforms of boards, in which two men sit at opposite ends, and perform the breakage. The platforms are set on wheels, and are moved along the drain as the work is performed: the sides are one to two feet high, in order to contain the broken stones. When a quantity is prepared the materials are placed in baskets and deposited in the drains, which are deepened in the six inches that was left, and just as quickly as the stones are broken and ready to fill the cavities. This process can be arranged to suit the readiness of the materials, so that the drain does not lie open after being dug and the earth crumble into it. The filling is immediate after being dug, and the covering of the stones being ready is placed over the materials, and the loose soil being shovelled into the cavity by contract, the drainage work is finished.

The precaution of filling from baskets into drains the broken stones that are prepared for that purpose removes every objection of earth and mud being mixed with the stones, as happens when broken in heaps or in a quarry where the rocks are dug. A screen has been used, and with very much advantage, which is placed on a wheel-barrow for the sake of being moved, with a slanting direction from the top into the drain. The carts with the broken stones come alongside the screen, and being placed by shovels into the top of the implement, the lumps run to the bottom, and are turned by a board into the bottom of the drain. Meantime the small earths pass through the first and wide screen into a narrower one, which conveys the minute earths to the surface land, where it is lost, and the rougher matters into the box of the wheel-barrow, whence it is laid on the top of the levelled stones in the drain, and forms a very good covering for the broken materials. This process makes sufficient work in the convenient situations, but is not so generally commodious as the method that has been recommended in the drains being excavated in the bottom, filled and covered on the same day. This is a very great advantage, and merely requires the readiness of all the materials alongside the drains, and to proportion the digging of the bottom of the drains to the quantity of broken stones that can be prepared. Being so done the arrangement is the most perfect performance of the work of drainage.

When tiles are used, the articles are laid on the ground from the carts along the line of drains, which, as the filling is ready, may be excavated at once and filled as the

digging is performed. When the bottom is seen to be soft, flat soles are placed below the arched tiles, to prevent the sinking and obstruct the passage of the water. This precaution has been very amply confirmed by experience. A small flat tile being placed at the joining of two arched tiles supports both, raises them from the ground, which readily admits the water below the sides.

The digging of under-drains and the filling of the cavities with loose earth over the deposited materials may be done by contract, as the work remains in view, and can be amended when done amiss. But it is most essential that the filling of the interstitial materials be done by a trustworthy and confidentially selected person, who is rewarded with a liberal remuneration to obtain the faithful attention. This person receives the baskets of stones, empties the contents, returns them to be filled, levels the stones, and places the covering over the materials. The stones may be broken by the cart-load, the cubic yard on the platform, or by the baskets of small metal, of which an account is kept by the selected person that strands in the drain. The placing of tiles and soles in drains, and covering the filling, is done by the same confidential arrangement, which must never be omitted. True economy consists not in getting things cheaply done, but in the complete and proper execution of work; not in the pinched quantity of means applied, but in the doctrine of proportion reduced to practice. Contract work of every kind always requires a very sharp oversight, and in this case the digging of the drains will be very conveniently inspected and reported by the person who fills the cavities; and also the broken stones—if the proper size is observed in the pounded materials. The loose earth is filled into the cavities immediately upon the covering being placed upon the filling materials. All the operations are entrusted to the supervision of this person—the excavation of the drains, the preparation of the materials, the placing of the articles, and of the covering, and the replacement of the loose earth, which imposes the whole responsibility on one head. And this responsibility is even more effectual in that way than when scattered in several hands and disseminated in many enquiries. The work must be so arranged that the excavation of the bottom of the drains, the filling and covering, and the replacing of loose earth are all done on the same day, and when night closes the work every part is finished to the farthest point. When unfavourable weather prevents any portion to be done, the whole work must cease and be simultaneously recommenced; drains that are exposed after being excavated in the full depth are crumbled into by loose earth that falls from the sides by the action of the air, and which is prevented by the immediate filling and covering of the drain. The confidential person who fills the drain must see that the whole operations are correspondingly executed. Work of any kind must be supervised by one responsibility, which is invested with the necessary power and authority to have its mastership respected.

EXPENSE

Of draining, like that of every other performance and operation, will vary according to circumstances—the cost and the distance of the carriage of the materials, and the price of the labour required to apply and adapt the materials to the desired purpose. A variation in the cost of draining will also happen from the greater or smaller number of drains that are required on an acre of land, and this occurrence itself must vary according to the extreme or moderate wetness of the soil. All these circumstances combined require a wider range of figures than at first sight would appear to be necessary; and to the causes above given there must be added the nature of the soil, if it be hard or soft, for digging. The frequency of the

drains may be stated in three divisions—in four yards apart, in five or six yards, and at eight yards; representing the wettest and most viscous clays, the medium clays, and the wettest loams, and the soils that require draining in the lowest degree of superabundant moisture. The expense of each separate performance is as follows: At four yards apart, drains $2\frac{1}{2}$ feet deep, and filled with stones, £10 to £11 per acre; at six yards distant, at £7 to £8 per acre; and at eight yards apart the cost is averaged at £5 to £6 per acre, the depth of the cavities being two to three feet. The expense of draining with tiles is a degree cheaper than with stones. The first case of four yards distant on the most viscous clays is about £8 per acre; at six yards apart the cost is £5 to £6; and at eight yards distant at £4 to £5. This latter estimate supposes the use of soles, on which the tile of four inches in arched cavity is placed. The general average of saving, by using tiles and soles in place of stones, is towards £3 per acre, and about £3 an acre by using pipe or circular tiles, which exceed tiles and soles by about £3 per acre. Our opinion most decidedly prefers tiles and soles to the pipe tile, as affording a much larger cavity; and this permanent opening constitutes a recommendation that is not exceeded by any other attachment in the performance of draining.

The utmost range of the expense of draining will be included within £5 to £10—not much will exceed the latter figure, or come below the former. A closer approximation will be placed within £6 to £8, and a general average may be stated at £7. Many variations will happen from local attachments, adventitious circumstances, and accidental advantages; but the above estimates will be found to be correct in the general positions of draining.

An acre of land drained at four yards apart requires 3,000 tiles of 12 to 15 inches in length; at six yards distant, the number required is nearly 2,000; and at eight yards distant an acre will require between 1,400 and 1,500 tiles. A cubic yard of stones of the size of road metal will fill to the depth of twelve inches about two rods or perches of drain in the width of 6 to 12 inches, which constitutes in point of carriage an advantage of nearly six to one in favour of tiles against stones, as a cart-load of the former will lay about 100 yards of drain, and, as carriage is the most laborious part of draining, it is a most important particular for consideration in undertaking the drainage of wet lands. The future saving of labour in working the land may be fairly estimated against the expense of carriage that is incurred by the first performance.

In an acre of land drained at four yards distant there will be 200 rods of six yards of excavated cavities; at six yards apart the number of rods will be 140; and at eight yards distant there will be 100 rods in the drained acre. The average cost of digging drains $2\frac{1}{2}$ feet deep, and two feet wide at top, and six inches at bottom, by the rod of six or seven yards in length, is 5d. or 6d., as the soil may be soft or hard; and the average expense of cutting and filling the drains is 1s. or 1s. 2d. by the same rod of length. This last estimate includes every material and all the expense that is incurred. The number of rods in an acre being multiplied by the cost, gives the amount of the general expense with the least possible trouble. It requires that correct accounts be kept of every operation, and the proper item of cost be charged for the performance.

All other kinds of under-drains are very deservedly superseded by the drainings that have been mentioned with stones or tiles. Where bottoms are soft, and must be used as foundations, flat substances, as thin stones, tile-soles, or alates, are placed below the filling materials, and support the interstitial cavity of stones or the arched tile. Consequently, the making of cavities with turf, peat, sod, brushwood, tubes, or pipes is seldom mentioned, and will

soon cease to be entertained. Where stones are not found, tiles may be manufactured, or conveyed to the destination at a tolerable expense. The grand purpose of permanency has adopted the drain of stones and tiles, to the exclusion of all other substances yet known.

ARRANGEMENTS

Between the landowner and the tenant have been very variously operated in the execution of under-draining. The object is a permanent purpose, and benefits a succession of the cultivators of the land, which, being improved in value, brings a higher rent to the owner than in the original condition. Hence, the greater part of the expense falls most justly on the landowner, who derives a permanent benefit from the process for an indefinite period of time; and the tenant, who bears the minor portion of the expense, must have such a length of security as will secure to him the reimbursement of the outlay that has been done by him. Two-thirds, or three-fourths, or four-fifths, which amounts do not differ much, are the very just and equitable allotments of the landowner's share of the expense, which consist in cutting the drains and purchasing the materials. The tenant expends one-third, one-fourth, or one-fifth in carrying the materials and placing them in the drains, filling the earth into the cavities, and finishing the process. In this way liberal landlords have expended three-fourths of the cost, leaving the remaining one-fourth to be done by the tenant.

The interest of the landowner in draining, is both immediate and prospective. The former claims a per-centage for the money expended; and the latter looks for an increased rent in the next occupation, as the first advantage ceases with the lease which had the draining performed. The profits from draining enable the tenant to perform the cartage of all materials, and also to pay, during the currency of the lease, a certain per-centage on the landlord's expenditure, either by the pound of money expended, or by the acre of land that has been drained. Five per cent. is charged from the tenant, where the landowner incurs the whole expense of draining, and five shillings per acre in cases of the tenant performing the cartage of the materials. This last very moderate and most equitable arrangement was adopted at the first beginning of modern frequent draining, and has continued to be used by the Duke of Portland on his extensive landed estates in England and Scotland, and gives much satisfaction to both parties. The per-centage on the money expended will depend on the cost that is incurred per acre, which will not be very high in this case, as His Grace adheres to the shallow draining maxim, "that in all purely clay soils the drains cannot be too shallow, provided they are not disturbed." And though our own opinion descends six to twelve inches deeper into clay soils than the above quotation allows, yet there is no more effectual drainage of land, as our own inspection has witnessed, nor a better arrangement with the tenants. In both the ways now mentioned, which are the two to be preferred, the whole work is done by the landowner's workmen, in order to secure a complete and permanent execution of the operation, excluding all performances by a temporary interest, that ever leads to a shuffling and careless execution. This is a most essential point, and did not escape the Duke of Portland's usual discrimination on such subjects. The landowner enjoys the certainty that the performance will endure for the benefit of the property, and that his money has not been expended for a temporary use. When the extent of the property, or other circumstances, do not allow the work to be done in this way, then a careful supervision must be appointed over the performances, and regulated accordingly.

A duration of lease may be granted, in which a wealthy tenant can defray the whole expense of draining; but not many cases occur, as the willingness is not very ready to

extend the necessary security. Yearly tenants perform the whole work, and have a tenant-right of ten years; and if they leave the farm, the unexpired portion of the expense is repaid. But this tenure induces imperfect draining, as well as bad farming, and may never obtain much favour. All arrangements yet devised are inferior to the landowners performing all or the greater part of the work, and receiving a per-centage from the farmer of the current lease. The rate of interest should not be more than 3 or 3½ per cent. The Government loans of money for the purpose of draining, at 6 per cent. for 14 years, have been attended with much benefit and convenience; and though the propriety is questioned of borrowing money for improvements, and burdening property with a rent-charge, yet no reasonable inheritor of landed property can grumble to pay an annuity by which the patrimony has been very much increased in value.

The benefits that are derived from the draining of wet lands are very large and undeniable. Clay soils are dried and altered in the texture, and rendered more accessible at all periods of the year. Loamy clays are very largely improved in fertility, and green crops are doubled in quantity from the wet porous soils that admit the root cultivation. All kinds of produce are much increased in the quantity and quality; and a general calculation admits that, after draining, three of the former crops are produced by the land in two years. But in order to derive the full effects of draining, it must be succeeded by improved treatment of the land in every respect, as to cropping and manuring, in order that its action may be advanced and forwarded by other encouragements. When land is drained in a state of grass, there will be fresh matters in the soil for decomposition, and then the liberal application of calcareous substances becomes highly desirable. It has been admitted in all ages of the world that draining of marshes and stagnant water is highly conducive to health and salubrity; and it may be reasonably supposed that the frequent draining of wet lands, though performed on a smaller scale, will operate in a similar manner. It carries away or prevents the generation of the pestilential miasms that originate in distempered and poisonous bodies; and lime arrests the noxious effluvia that tend to rise more or less from every soil at certain seasons of the year, and decomposes them, or causes their elements to assume new forms of chemical combination, in which they no longer exert the same injurious influence on animal life. How beautiful a consequence of agricultural skill that the health of the community should be promoted by the same methods which most largely increase the produce of the land! Can it be doubted that the all-benevolent Creator of the world places this consequence so plainly before mankind as a stimulus to further and more general improvement, to the application of other knowledge still to the amelioration of the soil! What a

noble employment for the mind of man! By the use of his reason, energies, and capital, he affords, in the first place, employment for his fellow-creatures; then an increase of food and of health to the human race; and lastly, a remuneration for himself. What more can his heart desire? There is nothing wanting to satisfy either the selfish or the philanthropic mind; and a heavy responsibility rests upon the non-performance of the incalculable benefits. Under the wide expanse of heaven there is not, nor can there be, a more gratifying employment than improving the condition of the human race; and there is employment, food, and health to be derived from a source the most rational under heaven—from the cultivation of the earth, the unalienable patrimony of the human race. The results are not confined to the individual operators; they swell into national importance, and claim the attention of the philosopher and statesman, as well as of the owner and cultivator of the soil. Every interest must give way to the general interest; but here are no opposition, nor any jarring contention; for every party is benefited, and the general good promoted. The labourer finds employment, the farmer obtains an increase of produce, and the landowner gets his property improved in value and a remuneration for his capital; the nation enjoys a climate salubritized by the process, and an increase of food, the essential element of life, on the regular and ample supply of which articles the property of any social community almost wholly depends. Those persons who write about man, and the different states and stages of his existence, social, moral, and political, would do well to remember two things—the cultivation of the earth, and the supply of the necessities of life; for they uphold or overturn all their ideal fabrics. Of all intents that can be entertained by the mind of man, or enter into any human consideration, no single one, nor any number of them, are any way to be compared with the employment of labour and the adequate supply of the necessities of life for the use of the population of any kingdom or country. The structure of social and political theories serves only to show the sandiness of the foundation and the unskilfulness of the architect; the framing of commercial codes and artificial regulations merely discover the ignorance of the compilers: time and circumstances overturn all such baseless fabrics. But sound practical performances withstand all changes, and never desert the expected benefits. No government can bestow on its subjects—no legislative enactment can confer on the human race—no class of men have it in their power to give to another class—benefits any way comparable with the blessings that arise from employment of labour and the supply of the necessities of life, the increase of the quantity of articles cheapening the value and enlarging the sphere of their use. This sober truth will be established by time and the lessons of experience.

THE ACTION OF WATER UPON PERUVIAN GUANO.

[TRANSLATED FROM THE FRENCH.]

If it be true that manures are more active when their fertilizing properties are most soluble, agriculturists will learn, not without some interest, how they may increase the solubility of phosphates of guano from the Isles of Chincha (Peruvian guano), and consequently their fertilizing power. For this purpose, all that is required is to dilute the guano with water, and leave it in contact with the liquid for some time.

The following was the result of the first experiment; 1

kilogramme of Peruvian guano (14 per cent. azote and 26 per cent. tribasic phosphate of lime), after having remained in contact with 4 kilogrammes of water for 24 hours at an ordinary temperature (15 to 17 deg.), yielded to the liquid a quantity of phosphoric acid corresponding to 15 grammes of tribasic phosphate of lime.

We repeated the same experiment under the same conditions, with this exception, that the guano was left in the

water 10 days. At the end of that time, we found in dissolution a quantity of phosphoric acid equivalent to 21 grammes of tribasic phosphate.

Again, a third experiment was tried, prolonged to 25 days. This time we discovered in the water sufficient phosphoric acid to represent 76 grammes of tribasic phosphate.

Thus, at an ordinary temperature, 1 kilogramme of good Peruvian guano imparted to the water in 24 hours, the phosphoric acid of 15 grammes of tribasic phosphate of lime; in 10 days, 21 grammes; and in 25 days, 76 grammes.

Before going further, permit me to compare this experiment of the laboratory with what takes place on a large scale when we use guano as a manure. We know that guano produces little effect in very dry years, and that the most favourable condition to the development of the fertilizing action of that manure is a light rain succeeding its being spread. It is evident that the rain assists not only in making the naturally soluble principles of guano penetrate into the soil, but in rendering soluble other principles which are not so of themselves.

Former experiments made by several chemists, amongst others MM. Dumas and Boussingault, have shown that the insoluble phosphates, especially those with a base of lime, change partly to a state of soluble phosphoric acid, by the prolonged action of organic matters. For my part, I have never examined a phosphate containing organic substances without finding in it quantities more or less palpable of phosphoric acid. Consequently the changes which take place in Peruvian guano under the influence of water might be foreseen, when that manure contains organic substances in a large proportion.

I doubt, however, whether this be the principal cause of this phenomenon, for if it is certain that organic substances tend to render the phosphates soluble, it is equally certain that their dissolvent action is very slow.

I washed carefully 1 kilogramme of the same Peruvian guano which was used for the preceding experiments, after having diluted it with 4 kilogrammes of distilled water, into which I introduced 40 grammes of flesh, 50 grammes of turf, and 10 grammes of the excrements of the boa constrictor. In making this mixture, I intended to submit the guano to the action of organic matters, the whole being excluded from the action of the soluble salts, which characterised it, and which the previous washing had extracted.

After 25 days' contact, having stirred the mixture several times a-day, I filtered it, and sought for the phosphoric acid, in a state of dissolution in the liquid. I only found 10 grammes 56 centigrammes of tribasic phosphate of lime, that is to say, 7 times less than was given by the same weight of guano unwashed.

Either I am very much deceived, or this experiment proves that, all things being equal, the organic substances contribute in a feeble measure to give solubility to the insoluble phosphate of lime in Peruvian guano, and that probably the salts belonging to that manure are the principal cause of the result.

But what are these salts? what is their proportion? and how do they render soluble the phosphate of lime?

Most rigid analyses have shown that the soluble salts contained in Peruvian guano from the Isles of Chincha amount to 14 or 15 per cent., and that amongst them we find chlorides, oxalates, alkalies, and ammonias. We know from numerous experiments made by different chemists, especially M. Liebig and M. Robierre, that several alkaline salts have the property of dissolving phosphates of lime, and I may add that there are some which decompose it, and cause the phosphoric acid to assume fresh soluble combinations; such are the oxalates, alkalies, and ammonias. In fact, if we boil together the right proportions of tribasic phosphate of lime and an oxalate alkaline salt, the phosphate of lime changes almost entirely into an oxalate state, whilst the alkali of the oxalate changes into a state of soluble phosphate. If we repeat this experiment with a neutral alkaline oxalate, such as potash for example, the decomposition will still take place, though in much smaller proportions.

It is evident that changes caused by heat will also take place by cold, though more slowly; and although former experiments made by me upon the reciprocoction of salts, and others more recently made by M. Robierre for the purpose of comparing the dissolvent action of different salts upon tribasic

phosphate of lime, authorise me in affirming it, I am nevertheless willing to submit a series of samples of tribasic phosphate of lime of different productions to the prolonged action of salts of sorrel (oxalate acid of potash), in order to dissipate any doubts upon the subject. The results will be found in the following table.

Summary of results obtained by the action of cold from salts of sorrel during 25 days upon different specimens of tribasic phosphate of lime:—

	Water	Salt of sorrel	Phosphoric acid rendered soluble & extracted from tribasic phosphate of lime.
	Gr.	Gr.	grammes.
Artificial phosphate of lime—80 grammes	800	10	12.40
Peruvian guano, calcined and washed—100 grammes	800	10	10.85
Baker guano, calcined and washed—70 grammes	800	10	8.06
Calcined bones deprived of their carbonate—80 grammes	800	10	7.16
Quarry guano, washed and calcined—200 grammes	800	10	6.98
Fossil phosphate—66 grammes ..	800	10	4.98

* Quarry guano comes from Cape Horn: it contains phosphate of lime and alumina, together nearly 85 per cent.

These experiments prove that tribasic phosphate of lime is decomposed by cold through the soluble oxalates, and that its phosphoric acid changes partly into a soluble salt.

We may safely affirm that if the prolonged contact of Peruvian guano with water gives a certain solubility to that manure, it is caused by the dissolvent action of the salts which it contains; and as all the manures of that kind do not contain soluble salts, they will be scarcely affected by the action of water. In fact, a kilogramme of Peruvian guano after having been deprived of all its soluble salts by washing it, and having been left in contact with 4 kilogrammes of water for 25 days, produced, after the liquid was filtered, a quantity of phosphoric acid, equivalent to 3 grains of tribasic phosphate, or 1-1000th of the guano used.

It is important to observe that the guano, when washed, did not contain less of the organic azoteous matters which produce carbonate of ammonia—a salt which acts in its turn upon the phosphate of the manure, rendering it soluble to a certain extent.

It is needless to say that guano, deprived of soluble salts and organic substances, would be scarcely susceptible to the action of water. We may prove this by leaving for 25 days, in contact with water, some Baker guano, previously washed, and consequently deprived of all the soluble phosphate it contains. It is a rare case if, after that lapse of time, we find in solution in the water as much phosphoric acid as would be equivalent to 1-1000th of the guano. We know that Baker guano contains scarcely any organic substances.

In conclusion, if the guano is of good quality, if it contains soluble alkaline salts and ammonia, as well as organic azoteous substances, a sufficiently prolonged contact with water previous to its introduction into the soil greatly increases its fertilizing power.

If the guano contains neither soluble salts nor azoteous substances, the previous action of water will have no effect; and, in order to make it otherwise, it is necessary to add (according to the experiments of Liebig) some soluble saline substances, such as some marine salt. The addition of this substance will be besides very useful, whatever be the quality of the guano.

It is probable that agriculturists would find it troublesome to spread the guano in a liquid state, accustomed as they are to use it pulverised; but it is easy to make the guano diluted with water dry again, by adding a sufficient quantity of earth. The bulk of the manure will be increased, its distribution over the soil will be more even, and it will be more easy to spread. The increase of hand labour would be more than compensated by the increased fertility of the manure.

MALAGUTI, Professor to the Faculty of Sciences at Rennes, Correspondent of the Institute and of the Imperial and Central Society of Agriculture in France.

THE POULTRY, PIGEON, AND FRUIT SHOW AT THE AGRICULTURAL HALL, ISLINGTON.

This exhibition opened on Wednesday, Aug. 26, and was continued to the two following days. A better building for the purpose could not have been desired, and we hope that this is but the commencement of a series of similar shows in the same place, possessing at it does, every requisite for the purpose.

There was a large show of fowls of almost every class. The first prize, consisting of a silver cup and five guineas, was awarded to the Viscountess Holmesdale, for a cockerell and pullet of the coloured Dorking breed, only five months old, but of extraordinary size and great beauty of form and plumage. There were seventy pens of this most useful breed which still bears the palm over every other in real value. There were forty-three pens of Cochins, and they doubtless do credit to the breeders of as ugly a race as can well be patronized. Some of them, however, we suspect to have borrowed their plumage and a shade of their form from the English breeds, but no cross can make them equal to the latter. Amongst the thirty pens of Spanish we noticed some remarkably fine specimens; but the fifty-three pens of game-fowls excelled all the rest in beauty of plumage and symmetry and boldness of bearing. They may not be so profitable as the Dorking, but in delicacy of flesh and every other respect they stand unrivalled amongst their compeers, and it is matter for rejoicing that they are now kept for other purposes than to gratify the brutal desire of some to see them tear each other in pieces. The Polish fowls though not numerous were very fine, especially the gold and silver birds. The white-crested one that took the first prize was exceedingly handsome. The long-legged long-necked Malays did not shine, and we suspect are not very profitable fowls. Our little favourites, the bantams, were in great force, and by their ridiculously bold bearing must have considered themselves quite on a par with the game-fowls in pluck and power. Woe be to the dunghill fellow that intrudes upon bantam's domain or harem! Certainly, they are a beautiful breed of fowls, but of course are quite a fancy one. The show of geese and ducks was very small, but there were some magnificent specimens of both—ducks as large as geese, and geese almost swans. Of turkeys, the show was more meagre, and no ornamental water-fowl made their appearance except one pair of Brent geese.

Of pigeons, there was a very large show, but we have no space to go through either those or the rabbits, which were also very numerous. There were 217 pens of the first, comprising every variety, some exceedingly beautiful, others of large size, whilst one or two classes were quite new to us, having never seen any of the kind before. Of the rabbits, the long-eared species predominated, and some of them were remarkably fine animals, but we cannot see any beauty in the length of ear they displayed. Upon the whole we consider the show a decided success so far as the number and excellence of the specimens was concerned, but we wished to have seen a larger attendance of visitors.

The stormy weather of Tuesday happened unfortunately for the Flower Show at Islington, as many of the growers gave up sending plants altogether in consequence, and some of those who did send got them so seriously damaged in the transit that they could not bring them forward; and this necessarily contracted it within small limits. Messrs. Cuthbert and Henderson exhibited a

choice collection of fine foliaged plants, which occupied the whole of one side of the building, and were shown to good advantage against a crimson background. Facing these was a collection of ferns and miscellaneous plants in bloom, principally from C. Grimbley's Albion Nursery. Among these were four large and well-grown fuschias exhibited by E. Shinton, Hendon Park.

The centre was occupied by cut flowers, in which all the principal growers were well represented. Messrs. Paul and Son were the only exhibitors of roses, of which they had a good variety of fine blooms, and for which they of course carried off the first prize. Of pansies there was a very small collection. Seedling hollyhocks were very fine, both in shape and colour. Messrs. Downie and Laird were awarded the first prize for these, while those second in the list of merit (shown, if we recollect right, by W. Chater, Saffron Walden) were scarcely less beautiful, though not quite so close and compact. We must, however, in common with some of the first horticulturists in the kingdom, express our opinion in favour of showing the whole spike. As some of the leading periodicals have observed, it is a comparatively easy thing to find one or two perfect blooms; but, after all, the test of merit is in the whole. There was one fine spike thickly studded with blossoms, but we cannot remember the name of the party who sent it. Of dahlias, there was a considerable variety, and among them some very excellent seedlings. A. Moffat, gardener to Viscount Maynard, was awarded the first prize. Further on was a fine display of verbenas, for which Perkins and Son gained the first prize, and beyond these a stand of beautiful asters, the first prize for which was gained by C. Standford, gardener to Mr. Thomasett, Walthamstow, while Messrs. Paul and Son were awarded an extra prize for a collection of great merit. A well-filled box of phloxes, and a small case of fine seedling gladioli, from Williams, Paradise Nursery, completed the display of cut flowers.

There were but few competitors for the prize for table decorations, and only one group worthy of notice—that from Messrs. Cuthbert, who arranged his flowers in stands of the form designed by Mr. Marsh, who has been so successful in competing for Lady D. Neville's prizes. The great fault in most of the groups arranged for decorative purposes is that they are too bizarre. Persons attempting exhibition in this department should remember that a few flowers well contrasted in colour and tastefully intermixed with graceful foliage, have a far more pleasing effect than a number of flowers of different hues huddled together; for however beautiful each may be in itself, nothing can make them appear other than a gaudy mass.

The fruit stand was well filled with a good variety from all the large growers. Figs and cherries were particularly large.

Messrs. Lane and Son came out in full force with their fruit trees in pots in full bearing, and gained prizes both for them and gathered fruits. Of apples there was a considerable variety, and Messrs. Turner gained first prizes for these and others.

We must mention one novel feature in this Flower Show—the introduction of stalls in different parts of the room for the sale of toys, jewelry, plate, house and agricultural implements, &c., &c.

The music was admirably selected and as admirably performed by the bands in attendance.

IRRIGATION AND THE FORMATION OF WATER-MEADOWS.

Notwithstanding the acknowledged superiority of English farming over that of any and every other country of Europe, there is one branch of that national industry in which the British farmer is greatly behind some others who, in respect to the general management of land, make no pretensions to cope with him. We refer, at once, to the practice of irrigation and the formation of water-meadows, than which there is not an improvement productive of greater profit, or one that is more needed. Go where you may, and into whatever part of the country, you will find low, rough meadows covered with rushes and coarse grasses, the produce of which is scarcely sufficient to support a few lean stock; and, at the same time, there pass through many of these streams of water sufficient, if properly directed, to convert them, at a trifling expense, into valuable pasture lands, or those productive of large crops of hay. There is no mistake or exaggeration about this, for in many parts of the country such worthless commons have thus been improved, and yield crops of grass capable of supporting large herds of cattle or flocks of sheep. Such a practice is, however, confined to a few counties; for, in the greater majority, you will scarcely meet with a single water-meadow or irrigated pasture, although an abundance of water runs to waste over the lands. This, then, is a subject that is well worthy of consideration.

In Italy, and especially in Lombardy and the Duchy of Milan, the practice of irrigation has prevailed to an immense extent for many centuries. All streams of water, whether rivers, brooks, or springs, are vested by law in the Sovereign, who has the right to let or sell the privilege of using it to any occupier or proprietor of land. So well is the value of the water for irrigation understood by these, that the whole country round the city of Milan and other parts is intersected with canals and aqueducts for the conveyance of water to the lands, sometimes at the distance of miles from the source. In some cases a large proprietor will hire, or purchase for a series of years, the whole of the water of a brook, and then let it out to the neighbouring farmers at so much an hour or half-hour once a week, the quantity regulated by a tube of a specific diameter. In other instances the property in the streams is held in perpetuity, and disposed of independently of the land tenure. Every new spring that is discovered becomes the origin of a canal. Arthur Young mentions a case he knew, of a spring between Milan and Pavia, which was discovered by a person whose land lay two miles away from it. He first bought the land on which the spring was situated, and then cut a trench across the lands of other proprietors lying between the spring and his own land, of course paying them for the privilege, which, in fact, the law allows him to do, no person having the right to object to the water being conveyed through his property, on being paid for it. By this means the discoverer of the spring at once converted a poor hungry arable gravel field into a very fine watered meadow. It is difficult to trace this practice in Italy back through the middle ages; but there are records in some of the monasteries that prove it to have existed so far back as the year 1037, which is upwards of eight hundred years; and it is not improbable that it was commenced soon after the decline of the Roman Empire; for, in the eleventh century, water meadows were common in Lombardy, and are called *pratoroco* in the ancient writings of the monks. Some of the canal works, for the purposes of irrigation, are upon a very large scale, and have been constructed for many

centuries. These are so managed as to be emptied once a year for the purpose of being cleaned and repaired.

It may be said that in our colder and moister climate irrigation is unnecessary, the land being watered enough by the rains that fall so frequently and copiously; but this would be a great mistake. Experience proves that the practice of irrigation is as profitable in England as it is in Milan, and that the improvement of waste land by it is as great as in any other country. In several counties it has prevailed for many years, and has been attended with great success. The principal of these are Devon, Gloucester, Wilts, and some others; and of late years water-meadows have been formed in Hampshire, at an expense of from £15 to £20 per acre, and are found to remunerate the owners abundantly. In the golden Vale of Herefordshire irrigation was practised as long back as the reign of Elizabeth and James I.; and a book was written on the subject by one Rowland Vaughan, who held lands in the Vale. The Gloucestershire farmers claim the honour of the invention, but they cannot trace the practice in that county so far back as those of Hereford.

The advantages of water-meadows are very great and numerous. Not only are otherwise worthless pastures rendered highly productive, but the grass is produced at so early a period as to be invaluable, especially to those who keep flocks of breeding ewes, to whom they produce a seasonable supply of the most succulent and wholesome food, when the turnips are getting too forward to be fit food for them. Properly managed, water-meadows will have an abundance of grass at the beginning of March, and will supply a large number of sheep or cattle till the end of April, after which, if shut up and flooded, they will yield a heavy crop of hay within six or seven weeks; and the aftermath will be as abundant till the end of October—for cattle, but not for sheep, which are liable to take the rot if fed on the autumnal grass, although they never receive harm from the spring feed.

The Rev. Mr. Wright, who was curate of South Cerney in Gloucestershire, wrote a treatise on this subject, in which he adduces many instances of the surprising effects of irrigation. One field of 6½ acres supported 200 sheep from the 1st March to the 1st May, and the hay upon it was sold for 30 guineas, and aftermath for 6 guineas. In another case, a piece of land of 7 acres, the whole crop of grass on which for the year was sold for £2, being converted into a water-meadow, was ever after let at £3 per acre. Morton, in his *Cyclopædia of Agriculture*, mentions a case more recent, in which the tythe of a water meadow sold for 5 guineas per acre. It is estimated, we think very moderately, that upon an average there are at least 2,000 acres in every county in England and Wales capable of being converted into water-meadows, the value of which would be increased at least £2 per acre. It is also supposed, for there are no reliable statistics, that there are not more than 100,000 acres in the kingdom under systematic irrigation, and these are confined to a few of the counties.

The great difficulty in the way of irrigation is the existence of water-mills, the owners or occupiers of which are usually very tenacious of having the water encroached upon. Some of these pretensions however have been disposed of by the late Drainage Acts, and also by a decision or two in the Law Courts, which have declared that an occupier of land has a just right to make use of the water running through his land in any way he may think bene-

ficial to himself. These decisions remove to a certain extent the obstacles in the way of irrigation; but still the rights claimed by the water-millers stand in the way of a large number of farmers who would be glad to turn the waters of the neighbouring streams over their lands, were it not for the fear of a suit-at-law which would be sure to follow.

Devonshire has long had a system of irrigation to a very considerable extent; but until the last few years it was very imperfect, owing to a want of knowledge of the principles of hydraulics and hydrostatics amongst the farmers. Mr. Bickford, who we believe is a landed proprietor in that county, observing that a great deal of money was frequently thrown away to very little purpose, and having himself studied the subject, conceived a plan of conveying water over a pasture-field, of whatever irregularity of surface, without attempting to level or break it up, and thus avoid the heavy expense that operation would entail. The following is a description of what is called the "Catch-work System of Irrigation," which has the prestige of having been approved of by the late Mr. Pusey and other eminent agriculturists, by whose recommendation it has been introduced into other parts of the country.

Having led the water—which we take for granted is at hand—to the field, the first thing is to cut a *main carrier* or gutter along the highest part of the ground, and, if possible, the whole length or width of the field, as the case may be. This cut receives all the water from the brook or other source, and may be considered the main artery from which the smaller irrigating gutters are supplied. This main gutter should have an inclination of two inches in every chain, if it can be obtained; but if not, without difficulty, a less fall will do. It should be 18 inches in width, and from 6 inches to a foot in depth, according to the nature of the ground and the quantity of water to be conveyed. The above width is the head of the cut. As it proceeds it diminishes in width, until it ends in a point at the extreme end. Small gutters or irrigators are cut below the main carrier, at different levels, but in the same direction, to catch the water as it overflows the main carrier. These should be quite level, and the following is the method of forming them. An instrument of wood is used, in form of an A, the legs of which are each five feet in height and kept four feet apart at bottom by a bar, in the centre of which is a notch. A plumb line is suspended from the apex, which, when the legs are resting on a perfect level, crosses the bar exactly at the notch. Beginning at the side of the field nearest the head of the main cut, the operator holds this implement firmly in his hand, resting one of the legs on the ground, and turning the other about as he would the leg of a pair of compasses, *until he finds the plumb line exactly in the notch*, which is a proof he has found a level. A lad then cuts a piece of turf at the spot, and the operation of turning the leg of the implement is repeated, and so on until he can no longer find a level, or has arrived at the other end of the field, when he must go back and begin in the same manner to lay out another and another, until the whole is finished. These irrigators, if properly constructed, will convey the water evenly over the whole meadow, however irregular the surface may be; and a little practice and observation will enable a person of common judgment to lay the gutters to the best advantage.

It is of the first importance that the water should be prevented from being stagnant on any portion of the land; otherwise coarse grass and rushes would spring up, as in the case of neglected meadows and the vicinity of springs. In fact, water-meadows should always be thorough-drained before irrigation, in order to obtain a fine quality of grass, the drains being four feet deep if the fall will allow it. The water should never remain long on any part of the

pasture; and if a hollow occurs, an outlet from it should be made. The sods taken out in cutting the gutters should be laid and trodden in where there is a hollow, by which the surface may be considerably modified.

Gutters are also to be cut in the direction in which the water would flow if left to itself; it being of the first importance to get it off the land as quickly as possible. Stops are placed in these, as well as in level gutters, where it is necessary to confine the water to a particular part. The water should never be allowed to stand still, or to get so deep as to cover the tops of the grass. The irrigation is perfect if you walk in a meadow under water, and find it so by wetting your feet without seeing the water.

After passing over the whole land, the water which escapes to the bottom of the field is conveyed away in an open drain, which is narrowest at the upper end, and increases in width to the final outlet.

The expense of this system of irrigation Mr. Pusey estimated at £2 per acre, including every item; and where no natural impediments or drawbacks exist, his estimate did not amount to more than £1 per acre. When we contrast this with the expensive *bed-work* irrigation, which in some cases costs from £15 to £20 per acre, and that where carried out judiciously the Bickford system is quite as effectual, it recommends itself to the tenant-farmer. Mr. Bickford, in his pamphlet on the subject, states that lands thus irrigated by the landlord have been let at an advanced rent of from 40s. to 50s. per acre. Some persons think that simple irrigation with water from a brook or river will be quite as efficacious as sewage irrigation; but this can only be the case where the water is strongly charged with organic matters, or with a solution of those mineral substances favourable to the growth of grasses, such as calcareous earths of all kinds, and those essential portions of animal and vegetable remains taken up by the waters in passing over the land into the streams after heavy rains.

Attention, however, should be given to the quality of the water and its mineral properties. Some waters, such as strongly chalybeate springs, would be injurious; and it will, therefore, be proper, before turning springwater upon a meadow, to have it analyzed by an agricultural chemist, the expense of which is a trifle compared with the importance of being certain as to the properties of the water.

Having ascertained this point, any tenant farmer who has a lease of his farm, and a stream or spring of water convenient, will greatly increase the productiveness of his farm by irrigation. *Without manure* he will increase the cattle food of his land, by which he will at the same time raise a larger quantity of manure for the rest of the farm, so that the whole farm will at once feel the benefit of the system. The expense is a trifle, the benefit great and permanent. Therefore, we say, irrigate, irrigate, irrigate!

DESTROYING THISTLES.—Don't be alarmed, reader! I don't intend to offer any new-fangled, patent method of operation, which "costs more than it comes to;" neither am I going to tell you that I have found out any particular phase of the moon when it can be done most effectually. But there is a common-sense method of destroying this weed, which is to mow the thistle about when it is in blossom. At that period of its growth, the stalk is hollow; and if there is rain soon after the cutting, the hollow stalks will fill with water, which is pretty sure to cause the decay of the root. Cutting them two years in succession at this period will be sure to destroy them root and branch. Farmers, look out for them, particularly on the roadside, for there is the nursery of the evil; and further, if your neighbours won't cut those bordering on their land, it will pay to do it yourself.—*Maine Farmer.*

THE ROYAL NORTH LANCASHIRE AGRICULTURAL SOCIETY.

MEETING AT LANCASTER.

If Jupiter does not frown on the endeavours of the Royal Lancashire, he sometimes weeps over them; and the Thursday morning certainly opened ominously enough. The day, however, fortunately cleared, and it was not until the company were fairly seated at dinner in the afternoon that the rain came down in torrents, the lightning played about the tables, and the thunder rolled from above. The Council could thus congratulate themselves on "just" escaping another such a drenching as they were welcomed with at Preston, for there was another deluge on Friday; but no doubt the unsettled and threatening state of the weather still materially interfered with the success of an otherwise very meritorious meeting. The Lancashire Society possesses, in fact, all the essentials of a great gathering, did the ambition of the direction only reach to this; but like its near neighbour and rival, the Liverpool and Manchester Association, a deal of money is frittered away in small premiums under petty distinctions, with the object of especially encouraging the tenant farmers; many of whom are now quite strong enough to hold their own, without this careful protection of their interests; as was clearly demonstrated at Lancaster, where they frequently won with the same animals, alike in the open and local classes. In plain truth, the whole business is far too much split up and divided; while, if the North Lancashire and the Liverpool could only agree to unite their forces, there is little question but that they might straightway establish the first county show in the kingdom—Yorkshire itself not excepted. Even as it was, the entry of shorthorns was declared upon authority to have been one of the best ever brought together. Mr. Unthank—who with amusing egotism introduced himself in the course of the evening's proceedings as a judge of two hundred different occasions, and as one who had now acted at the Royal Society of England, as well as at the Great Yorkshire, and who might at that very moment have been fulfilling a similar engagement at the Royal Irish—this ubiquitous gentleman gave it as his experience that the Lancaster shorthorns were the best lot ever seen. And there was very palpable proof of this, with such herds as the Towneley, the Warlaby, the Branches Park, and others sending in their most famous cattle, as a mere enumeration of the prize-takers will assure any who may be yet sceptical as to the worth of so flattering an estimate. The several trials were, indeed, very similar to the running off the ties at a coursing match, and many of the best beasts already so well known and so often described in our columns, that it will scarcely be necessary to do more than embody the actual return in our report. In them, the class of all-aged bulls, Colonel Towneley's renowned Royal Butterfly, looking at just six years old gayer and handsomer and more bloodlike than ever, not only took the first of £10 with the silver medal, but also the Champion Cup, as the best bull of any age on the ground; while Royal Butterfly 11th, and a son of the first bull, was second; with Master Frederick, another of Colonel Towneley's, highly commended; and Mr. Jonathan Peel's Worcester bull, Hengist, similarly distinguished. In the younger class, Mr. Eastwood of course won with the Hero, the best male animal at the recent Royal Show; where we spoke of him as with hardly anything but his colour—white—to be offered against him: level and long, with capital hind-quarters, good ribs, a famous touch, and a happy combi-

nation of such essentials as symmetry, growth, and quality. Mr. Atherton was second with an American called "Lord Oxford 2nd," by no means so perfect an animal, and Mrs. Blundell, of Wharfedale, and the Rev. John Royds, highly commended—the one for Baron Ribblesdale, and the other for Lord Buckingham. The best bull-calf was quite as much a matter of consequence. Mr. Booth's thousand-guinea youngster, Prince of Battersea, small, straight, and neat, with a genuine Booth touch, good ribs and flank, and long hind-quarters—as we wrote of him in Yorkshire; his second being again the bloodlike Butterfly 14th, with Butterfly 15th highly commended, and Mr. Baxter's Prince of the North commended. The Pride of Southwicke suffered her second defeat this season in the cow class, where Queen of the Ocean was first and Lady Pigot second; the Queen taking further the Cup as the best of all the cows and heifers. Mr. Booth also received a high commendation for the companion cow, Soldier's Bride, as did Colonel Towneley for Rose of Lancashire and Roan Knight's Butterfly. The remainder of a large class was not of so high a character; but the names we have given are sufficient to show that at no other meeting of the year have so many good cows been brought together as at the Royal Lancashire. As a lot, the two and three-year-old heifers were not so numerous, but more evenly good; Lady Pigot winning with Rosedale, who took the Challenge Cup at Ulverstone two days previous; and Colonel Towneley claiming second with Royal Butterfly's Duchess; while Mr. Booth was highly commended for Queen of the May 2nd; thus reversing the Worcester award for her place and that of Butterfly's Duchess; Warlaby also being highly commended again for Lady Joyful. The whole class of yearling heifers were honoured with this high compliment; the especially distinguished being Colonel Towneley's Frederick's Farewell first, and Lady Pigot's Castanira second; with eight or nine other heifers from Towneley also in competition, the majority of these taxing the ingenuity of their sponsors to distinguish them as Butterfly's Pride, Burnley Butterfly, Butterfly's Pageant, Bampton Butterfly, Double Butterfly, Pretty Butterfly, and so forth. The best heifer calf was another daughter of Royal Butterfly, with Mr. Baxter's Pride of the North second, and yet one more Butterfly highly commended. The Judges of this really magnificent entry of highly bred shorthorns were Mr. Clarke, of Dumbleton, steward to Mr. Holland, M.P.; Mr. Dodds, of Watkinson Hall, steward to Mr. Ambler; and Mr. Patterson, from the neighbourhood of Stirling. Some of the same animals with the great winners "out" went into competition again before Mr. Stevenson, of Haydon Bridge, and Mr. Unthank, of Netherscales, for the local premiums—"open for competition to tenant farmers principally dependent on farming within the Society's district;" but it would be a tedious twice-told tale to follow this County Court through their proceedings.

The Sheep show very ably supported the exhibition of stock, and the opening class of shearing Leicester rams united great length, good character, and fine quality, with more substance than usual; Mr. Simpson, of Spofforth, Wetherby, taking the first premiums for both young and old rams, with Mr. Carr, of Bilborough, second for the shearlings, and Mr. Cock, of Coat Green, with a four-

year-old from Mr. Pawlett, as the next best of the next lot—a rather uneven class. The Duke of Devonshire's were generally the best Southdowns, though in the face of little or no competition; but the Shropshires were in more force, Mr. Johnson, of Frodaham, being first and second for shearing rams; over whose merits, we rather think, the Judges divided. Mr. Johnson was second amongst the old sheep, and Mr. Simpson first with a very clever compact short-legged ram. Mr. Jonathan Peel has it still all his own way with the mountaineers; but Mr. Chatburn "cut in" for the Leicester ewes with a pen of great sizeable level sheep; Colonel Wilson Patten taking second here, and first in the older class with five very good ewes. The best pen of ewes, however, taking the sheep show through, was that of Mr. Richards, of Preston, whose Shropshires had good heads, level tops, fine quality, and heavy flesh. Mr. Woodhouse's other long-wools were large plain lambs; Mr. Garnett, M.P., winning with a more stylish lot of short-wools. The awards of the several prizes in the sheep section were supported by numerous commendations from the judges—Messrs. Baxter of Skipton, Jefferson from Cumberland, and Preece from Shrewsbury—who, having ably discharged their duties so far, were requested to go "round them again," a repetition which we are fortunately not compelled to chronicle, the very local papers often declining to give the local prizes.

The judges of horses were tried in much the same way; brood mares, foals, yearlings, two and three-year-olds coming in again and again, as if to ascertain whether any change of opinion had occurred in the interim. This was more particularly the case amongst the horses for the Road and the Field; where, however, the judges made very short work of it on the second time of asking, taking their said acquaintance in and out again as fast as they could count them. The best thorough-bred stallion was old Sharston, a very good-looking horse, with capital action—a point in which he far excelled Schuloff, the champion cup horse of last year, but whose owner has now to hand over this trophy to Mr. Forshaw, who will hold it on behalf of the chestnut. The wording "of the best stallion for a road or field, *not* thorough-bred," left the judges no alternative but to go for a roadster, and they ultimately divided over two very good specimens of their order, Mr. Jackson's brown, called Young Pretender, and the Manchester roan, Pride of England, a great favourite in these parts, but without the style or action of the other; at least as the stranger maintained, and a referee being called in, he also took to this reading of the case, and gave his award for the brown. Mr. Knife's old brood mare for field or road was of a fine stamp, and Mr. Bousfield's second had length and action in her favour. Of the young things, Mr. Salisbury's best three-year-old, a son of Sharston, has a deal of style about him; and Mr. Gregson's brown two-year-old, the first of his class, is also very bloodlike; while the Messrs. Kennedy's best yearling, despite a big plain head, has all the makings of a hunter about him; and Mr. Venton's Sir Harry foal is wonderfully clever. Mr. Percy's prize Worcester mare, Crafty, won the challenge cup, as the best brood mare for road or field, being now stunted; but she was well beaten on showing again for the roadster-in-work premium, by a chestnut gelding of Mr. Foster's, the neatest nag on the ground. Mr. W. Smith's bay pony was the only one in a numerous entry of any great merit, and the chief attraction of the day, for which the thousands crowded the ring and hill sides, ended in very nearly a walk-over. This was the premium for the best hunter to "leap three flights of hurdles," which a very clever shapely old mare of Mr. Goodair's did in a sufficiently business-like manner to satisfy the authorities as to her character being up to her appearance. The judges over this highly popular performance, as well as for the other nag-horses,

were Mr. H. Corbet, of the Central Farmers' Club, and Mr. G. Garwood, of Milton, Cheadle.

Mr. Robinson's famous Young Napoleon was the only dray horse entered, though of course he took the prize. In another trial for another challenge cup, having already won one three years in succession, he was beaten by a very clever brown horse, the property of Mr. Eden, of Barnaley, which also received the premium in the class for agricultural purposes; Mr. Robinson here being highly commended for a grey, and Mr. Topping for a bay. Mr. Openshaw has now secured the cup for the best cart mare, having been first the necessary three times in succession with his grey; Mr. Eastwood finding the best pair of farm horses with two more grey mares, again the better horse. The young draught horses were a very mixed lot, and many of them apparently bred with little care or method; but Mr. Robinson sent a good three-year-old, Mr. Hodgson provided the first two-year-old, and Messrs. Robinson of Ulverstone the pick of the yearlings. The first cart foal was also on his own ground, as the property of Mr. Hodgson, of Dale Grove, Lancaster, and winning of course again in the local section, with the same second of Mr. Lamb's, and so on. It really sounds something like trifling to qualify an open victory, with another sovereign or a few shillings, as only the best of a limited lot. The judges here, who also declared that Mrs. Toulmine rejoiced in the possession of the best donkey, were Messrs. Cockburn of Glasgow, Hedley of Newcastle-upon-Tyne, and Patterson of Ulverstone.

The entry of pigs was not numerically strong; but with such exhibitors as Messrs. Wainman, Hickman, and Dickin to support it, the quality was good; the Carhead and Hull swine taking turn and turn about in the prize list for both large and small sorts, although Mr. Wainman, as usual, had a shade the best of it. These three names, coupled with a premium for Colonel Towneley in the extras, comprised the whole of the winners, and the judges, Messrs. Knowles and Wightman, had a far easier day's work than any of their fellows. Not that these were by any means confined to authorities on the several points of cattle, horses, sheep, or swine. The prize list of the Lancashire Society, and one that is really a respectable little volume in its way, includes classes for all kinds of poultry, for roots and seeds, and for butter and cheese, an agricultural product in the manufacture of which Lancashire professes to have no unbecoming fear of even Cheshire herself. Then, Lord Derby gave as a memento, on his retiring from the office of President, a premium of a somewhat peculiar character, but one that would gladden the heart of Mr. Alderman Mechi. It is thus worded: "To the Town or Village in North Lancashire containing a population of upwards of 2,000 inhabitants, that shall adopt a system of sewage as carried out at the Wallington College, Sandhurst, by which the sewage matter of the district is intercepted, and made available for agricultural purposes—£100." But so far, alas! there has been no claimant for this handsome offer, and the hundred pounds consequently remains in abeyance. There were, again, special prizes for green crops as shown in cultivation, and, as a prologue to the more general business of Thursday, a competitive trial of reapers and mowers on the Wednesday, when nearly all the leading firms were represented. The reaping was on a lightish crop of oats, and the mowing in an after-piece of grass; but the performance in either, and in the mowing more especially, was generally pronounced to be good, while the awards went in this wise:—The first prize for reapers, manual delivery, to Bamlett, of Ripon, and the second to Pickaley and Sims; the first for machines with self-delivery action to Burgess and Key, and the second to the proprietors of the Beverley Iron Works. The first prize of £15, with the Society's silver medal, was also adjudged to Mr. Bamlett,

who is taking a strong lead; with Burgess and Key second; and one of Wood's highly commended. These trials created great interest, but not so the stands on the ground, where the show was not large, and its due examination materially interfered with by the more exciting doings in the way of hurdle jumping and donkey racing. The judges of implements were Messrs. Bolton, of Ulverstone; Forester, of Stirling; Stubbs, of Liverpool; and Walsh, of Lancaster.

Springfield Park, thanks to the kindness of Mrs. Ripley, made a most delightful and convenient show ground, and Mr. Williamson was equally liberal in offering the use of his new mill for the dinner, but here the arrangements were not so good. Hearing anything was a matter of difficulty; considerably increased as this was by many leaving their seats and crowding up so soon as the talking commenced, and heightened by the unwarrantable interference of the local committee, who appropriated to their own purposes the table reserved originally for the directors, the judges, and other officials. Indeed, as these displaced functionaries wandered round the room, one was forcibly reminded of Goldsmith's lines:—

"'Twas their lot to live on without pension or place, sir,
To eat mutton cold, and cut blocks with a razor."

That is, if they could have had a cut at the municipal blockheads, who behaved so boorishly. Then, the Lancashire witches paid a shilling or two each, to sit for hours in a dull damp building, without even a biscuit or a glass of lemonade to warm their hearts, content, as needs they must be, with the glowing oratory of the occasion. The disposal of this, as usual, kept the farmer at arm's length, and with the business of an agricultural gathering entrusted once more to General Officers, Lords Lieutenants, High Sheriffs, Town and County M.P.s., Mayors and Corporations, and so forth. It struck us there was not much worth hearing when you did get a chance of doing so; but Lord Stanley, the President of the day, delivered a well-prepared address, in giving success to the Society, that was suggestive and appropriate, however open some of his Lordship's points may be to discussion. We offer it on these terms to our readers. Lord Stanley said: "The first question I ask in connection with an association of this kind is, 'Do the tenant farmers subscribe to it or not?' Because if they do not, if it is a mere landlords' affair, got up and managed and supported by landlords exclusively, it may be all very well in its way, but it is not rendering that assistance to the community which a society of this kind ought to render, and I am happy to say that according to the information I have received the proportion of tenant farmers subscribing to this Society is very greatly above the ordinary average in such cases. I am also told that such proportion is yearly increasing, and that is, I think, the more to the credit of the tenant farmers, for in this county we labour under some disadvantages, for the holdings are small, and there are some to whom, light as the terms of subscription are, they will probably be a burthen. Then, again, there are a large number of local societies—useful in their way, as they do a great deal of good in remote districts, and I will say nothing against them—but still the fact is, that these small local societies do tend to take away a good deal of the support which would otherwise be given to a central association like this. Taking into consideration these two circumstances, the multitude of small local societies, and the general smallness of our North Lancashire farmers' holdings, and also the fact that there are great numbers of Lancashire farmers who though regular attenders at the show yard, do not care to have their names figuring on the list of subscribers. I think we must conclude that the amount of support we receive from the farmers is such as to satisfy all that we are doing good work for the present, and such as to encourage us to hope well for the future. Now I pass on to a much larger subject,

to that with which it is the object of this Society to deal—I mean the state of agricultural improvement in this county. It is only thirteen years ago since the late Sir Robert Peel, one of the wisest men of his time, and also closely connected with Lancashire, wrote to an agricultural friend a letter, which has been since published, and in which a passage occurs to this effect, 'You will find many tracts of good land in Lancashire and Cheshire, with good roads, good markets, &c., but which are nearly in a state of nature, badly drained, and wretchedly cultivated.' Now, ask any one to compare the Lancashire of 1850 with the Lancashire of 1863, and to say whether the difference in those thirteen years is not greater probably than the difference in the 50 years preceding. Twenty years ago we started from a comparatively low level, and if we had confined ourselves simply to a consideration of the relative progress that has been made during the last twenty years, we have kept pace in point of improvement with any county in England. But while I say that, I am bound to add—and we should not deceive ourselves in this any more than in the other respect—that we are still, in point of agricultural improvement, very far behind those counties in England in which agriculture has been most attended to. I am not speaking now of that kind of improvement which may or may not pay, of the utilisation of sewage, or of the introduction of manure upon a great scale, applicable only to enormous farms and fields half a mile wide. I take our county as it is, a county of small farms, a county where capital has rather tended to go by preference into the town, and I say that as regards the simple and elementary processes of agriculture, improved and large fields, straight fences, and deep drains, there is probably at this moment not more than one-half of this county in the state in which it ought to be, in the state in which it might be, or in the state in which the next generation will see it. Only last spring I rode and drove through a great part of the Fylde district; I saw there a most interesting country; I saw small freeholders, hard-working tenant farmers, whose families have lived upon their land from time immemorial, gardens filled with flowers, and houses neat beyond the ordinary standard of English peasants. I beheld everywhere the signs of hard work, of honest independence, and even of a certain degree of comfort. In a social point of view nothing could be more pleasing; but when one came to look at it with the eyes of an agriculturist, I cannot say that the picture was equally pleasing. For there I saw water standing in pools on the land after a very little rain, and crops of rushes so luxuriant that you might have thought them the staple production of the soil. No doubt there are many exceptions, which perhaps it would be invidious to name, and therefore I shall not do so, but I may say that the description I have given does apply to a large portion of the county, and I have mentioned it because it confirms me in the opinion I have always entertained upon the immense benefit which the presence of the masters has upon the tenantry, for I think decidedly the most unsatisfactory estates I saw were those which are under the Duchy of Lancaster—under the Crown. Now in some other divisions of the county undoubtedly there is much greater progress than where I have been speaking of. I do not mean to flatter you, but I can say, on referring to early recollection, that I know no part of the county in which greater progress has been made than in the immediate vicinity of Lancaster. We have still large tracts of moor land unreclaimed, we have still many acres which only require the care to be drained, and we have still a very general want of deep trunching and straight fencing, and, above all, we have still comparatively speaking, made a very inadequate use of mechanical appliances for farming purposes. Now what is the explanation of these deficiencies? It certainly is not that we in Lancashire have a poor and encumbered race of landowners. Some such there are, of course, in this, as in all other counties; but, in general, I take it that we are more fortunately situated. It may be owing, then, partly to a fact which refers more particularly to the southern part of the county, where there are many landlords, especially those who have property near large towns, or on valuable mineral fields, and who derive their revenues from the buildings upon their land, and not derive any considerable portion of it from agriculture, and, very naturally therefore, are not so deeply concerned in it as if they did—partly also from another fact for which we must not forget to make due

allowance, namely, that the unequalled growth of the commercial and manufacturing interests in this country has very generally turned the attention of active and enterprising men with a little capital away from agriculture, and into the towns, where they are tempted to embark in manufacturing products. This is all very natural; but I am afraid they sometimes forget that there is a difference between the agricultural and the manufacturing risks. Another reason may be that, until within the last two years, we have been considerably hampered with the remains of the old system of life leases. Against that system it is unnecessary to say anything new, because it has been long since exploded. We all know how it takes away from the tenant his capital, and from the landlord all interest in his own estate, and how it introduces a gambling spirit into the relations of landlord and tenant. The system is exploded now, but I apprehend that very many of the evil results of the life leases still remain; and, wherever they do remain, they are undoubtedly an obstacle to improvement. Well then, on the whole what is our position? We have against us a climate less genial than that of the south, a soil which, though it has the immense advantage of being free from drought, is for the most part damp and stiff, not unproductive, but requiring a good deal of labour to till it. We have holdings generally smaller than is convenient, and we have not that agricultural experience, which in other counties has removed some of the most commonly prevalent obstacles. But, on the other hand, to set against these disadvantages, we have the advantage of an abundant supply of effective, though somewhat costly labour, we have a population increasing at a very rapid rate, we have an insatiable demand for all kind of improvements, and we have a class of landlords who generally have been enriched by the general prosperity of the district, and who are commonly recruiting, and I, for one, am glad to see them recruiting by a constant influx of new men coming from the town, and bringing with them new and active habits. Taking all together, and putting the good on one side against the bad on the other, it seems to me that we have not much to complain of. It is not climate, it is not soil, it is human industry, human skill, and human energy that in the long-run makes the difference between the producing powers of one country and another. Naples is a wild wilderness and Scotland a garden. Then I have confidence in the men of Lancashire. I know what they have done, what they can do, and I believe that agricultural science is comparatively in its infancy, and I confidently look forward to the day when an undrained field shall be rare sight, when smaller fences shall surround larger fields, when much of the work that is now done by hand or horse-work shall be performed by mechanical means, and when no man will enter upon the occupation of a farm without bringing with him some little capital, and without thinking it quite necessary to qualify himself by some professional knowledge. Now, gentlemen, these were other topics which I had intended to trouble you with. Upon one of these—the utilisation of swage—I will say nothing now; but the other—the more general employment of machinery in agriculture—is one which I cannot pass over without one word. As you all know, in every part of England, the thrashing machine has superseded the flail, and very rapidly the reaping and mowing machinery are superseding the scythes and the sickle. The next great step—and when it is taken it will amount to nothing less than a revolution in English agriculture—will be the introduction of ploughing by steam. But it may be asked, when costly implements of this kind become necessary, what are the small farmers to do—are they to go to the wall? It is a natural question, but I think there is a very obvious answer. The answer is, associations can do what individuals cannot, if these are societies formed for the purpose of introducing or letting out implements; how far these societies will succeed on a large scale is, of course, a question that I do not go into; but I have no doubt of this: if a few farmers in one locality, aided or not by their landlord, associate together to obtain implements of this kind, they will probably find that they are sure to be well repaid. Now I don't wish to suggest any rash or hasty or premature action in this matter. We may not yet have hit upon that form of machine which would be the most suitable. All I say is this: The question is one which cannot be avoided. Sooner or later, it will force itself upon you. At all times the competition between mechanism and hand-labour has been too unequally sustained; and I say those farmers will be the wiser who observe what has happened in other

branches of industry, and who take warning in time, and take care not to be left behind. Now only one last word, as to the show of the past two days. We have been more fortunate, on the whole, than we could have expected in our work. We have now the satisfaction of looking forward to a harvest which, though it may have suffered a little, is about the average; and I am informed—but you will probably hear this more in detail from persons better qualified to speak on the subject than I am—that, taking it altogether, the exhibition of this year has been the most successful which has been known since, sixteen years ago, the society held its first meeting here."

THE PARTRIDGE TO HER YOUNG.

BY N * * G * * N * * L.

A matron partridge did select, on which to pass the night,
The headland of a barley field, and thither did invite
Her covey young to follow her—in safety, she'd no doubt—
And, with the wisdom of a sage, she thus to them spoke out:—

"My young ones, gather round me now, and I'll to you relate
What, when a few more weeks are gone, will be our woful fate.

I do not wish with useless fear to make your young hearts quake;
But 'tis my duty thus to speak; yours, my advice to take.

"Last night, when sitting 'neath this hedge, and you were sleeping fast,
The farmer and his labourers—some four or five—came past.
The farmer leant on yonder gate, and to his men did say,
'My lads, you've all the turnips hood and safely stack'd the hay.

"To-morrow, yonder second crop of clover you'll go in;
That up, and weather fine, I think the harvest will begin.
This barley, even now, you see, is turning hard and brown;
And yonder wheat will very soon be ready to cut down.'

"My children, from that farmer's speech a warning we must take;
For quickly will these shady fields, by sweeping scythe and rake,
Be all laid bare, and we, alas! no more can in them lie
Securely hid from sniffing dog and gunner's eager eye.

"This hedgerow, though good cover, won't insure you safe repose,
For here you soon would winded be by pointer's clever nose,
And if to yonder wood you go, you'll surely be undone,
Some yelping spaniel will betray you to the treacherous gun.

"A field of beet is not far off, but be by me advised,
And don't go there, or you will find yourselves, one day, surprised.
The close-cut stubble you will find the safest place by day.
Where you may watch for enemies, though scorch'd by the sun's ray.

"Then, in the daytime, though exposed to rain and parching heat,
Keep to the stubbles, and, at night, to yon wood beat retreat."
She scarce had utter'd the last word, when, to her sore regret,
She found herself and family snug in a poacher's net!

July 21st, 1863.

THE SPARKENHOE FARMERS' CLUB.

MEETING AT NUNEATON.

One hears every now and then of some extraordinary feat of pedestrianism, when a man undertakes to pick up a hundred eggs at a yard apart, to run a mile, to walk a mile, to go fifty yards backwards and another fifty forwards, to trundle a hoop, to wheel a barrow, and to jump so many rows of hurdles, all within a given time. The programme of many an agricultural holiday now approaches very closely upon so arduous a performance, as year by year the prize sheet is gradually extended, with the public still admitted at ten o'clock, and the dinner fixed for three o'clock precisely. This was pretty much the case at Nuneaton, where the show ground at Weddington was if anything rather too ample in its dimensions, and the several sections, as a consequence, terribly scattered. You began, for instance, with a line of longhorns and shorthorns reaching out some quarter of a mile or so in length. Then there were horse-rings higher up, and sheep-pens on the other side, and a poultry tent here, and a flower-show there; while scattered about in other directions were well-classified departments for corn, and cheese, and wool, and roots, with still further afield a steam-plough at work, backed by a trial of reapers; together with of course the stands of many well-known firms taking up a distinct position as usual, and forming as it were an exhibition of their own. Even beyond the due examination of these various entries, there was the judging in public to be watched, the prize placards to be noted down, Mr. Newdegate's address to the labourers to be listened to, and, as the crowning performance of all, the hurdles to be jumped. You picked up a hundred different items of information at a hundred different places—you ran half a mile to witness the award for the £20 cup—you walked half a mile for sight of the shepherds' dogs at the very other extremity of the grounds—you walked back again for a look at Mr. Smith's famous Shropshire ram—you went on to find the first cart stallion—you strolled into the canvas-covered avenues to feast your eyes on the grapes and peaches—and, lastly, you descended into the bottom once more, to assist at the crowning business of the day, when the eighteen or twenty hunting horses went reaching up the long meadow to jump the hurdles. The Sparkenhoe Club gives away more than £900 in premiums, and then bids the visitors make the best use of their legs and eyes, as the ladies will sit down to dinner with them in some five hours or so from when the gates open. It is, in fact, from the first, a match against time, and so the sooner we go to work the better.

The Sparkenhoe Club, from its very position and the district embraced within its operation, possesses a speciality that few other societies enjoy. The show is invariably something of a contest between the Longhorns and Shorthorns; there is occasionally a distinct class, but still they are bound to come together for champion cups, and even at other times, when they are more directly pitted against each other. The very neighbourhood of Nuneaton, moreover, may be regarded as the stronghold of the Longhorns; and they certainly showed here in far more numerical force than we now ever see the breed at any other meeting. As fat Beasts, however, they have little chance with the riper Shorthorn, the more especially in so good an entry as that on Wednesday, where the judges of cattle, Messrs. J. Buckley, of Normanton Hill, and Mr. S. Boddington, of Kenilworth, commended both the

classes of fat animals, with which the catalogue opens. Mr. Swinnerton's ox is indeed a very grand beast, uniting size and wealth with capital quality. He deservedly took not only the first prize as the best ox, but also the additional £20, in plate or money, as the best of all the fat stock, oxen or cows; and he will, no doubt, be heard of again later in the year. This beast was bred by Mr. Stratton, of Broad Hinton, and is by Buckingham, out of Red Prim, the dam of the Christmas Gold Medal steer of some two or three years since. Lord Shrewsbury was second with a very neat three-year-old, though nowhere near the other; while the competition between the first and second cows was closer; Mr. Lynn's has great breadth, a fine bosom, a kindly look, and other points in her favour; but her touch was very loose and bad, and the first prize went to Mr. Pack's cow, that has not, on the first blush of it, anything like the appearance of the other. In the all-aged bulls for breeding purposes, Mr. Stratton entered on his own account with the Knight of the Lagan and Windsor Castle; the Judges preferring the former, to which they awarded the first prize; Mr. Wolfeston beating the younger bull from Bristol with one of Mr. Lythall's breeding. This would seem to quite accord with Mr. Stratton's own notions, as so satisfied is he with the importation of the Knight, that he has just hired the Lamp of Lothian, another Irish bull, of Mr. Crosbie. The best young bull was a straight level one of Mr. Robotham's, with Mr. Bradburne for second; and the pick of the Longhorns was again Mr. Twycross's, of Cowley; but as the same animal held the same place at Leicester last year, this will, we believe, disqualify him, and the prize go to Mr. Cox, of Spondon Hall, for a bull bred by that strong advocate of their order, Mr. Chapman, of Upton. After ceaseless forays during the previous week in the North, at Ulverston, Lancaster, Skipton, and Halifax, Lady Pigot's army of amazons were working their way home again, prior to their being disbanded in a week or two hence. Of course, the Pride of Southwicke had only to show herself to be pronounced the best cow in milk, it being still a moot point whether she is not yet the best cow of her time? It is true, Queen of the Ocean beat her at Lancaster, but the Pride beat the Queen again within two days after this at Halifax; while she has also since turned the tables on her superior in Durham, so that by the latest advices she will go up to the hammer as good as anything out. The recent career of Rosedale has been still more triumphant, and here, in couples with Princess of Edward, she not only took the first prize of her class, but further, when tried single-handed, the champion cup as the best of all the breeding stock, either males or females. Mr. John Lynn held the second place to Pride of Southwicke with his straight, clever cow, and Sir John Harpur Crewe had the next best pair of heifers in calf. There were a few creditable couples in a special class of longhorn heifers, of which Mr. Burberry and Mr. Twycross had the preference; and then followed a series of premiums for steers, stirks, and animals not entered in the Herd Book, the merits of which can never command much interest beyond their own locality. In these times the great prizes and prices go essentially for animals that *are* entered in the Herd Book.

If Nuneaton may be considered as the home of the long-horn ox, it is also the stronghold of the Shropshire

sheep, and there were accordingly some very excellent samples of the sort here, supplied as these were by such exhibitors as Mr. Horley, of The Fosse; Mr. Smith, of Sutton Maddock; Mrs. Baker, of Grendon; Mr. Bradburne, Colonel Dyott, Mr. R. C. Keeling, and others. The best shearing ram was a capital sheep, of great breadth and good touch, with a nice clean head and a deal of the right character about him. Mr. H. Smith, however, did not send him to Worcester, where, with luck, he must have had a place, as he here beat Colonel Dyott's second-prize Royal sheep, and the first of his class at Sparkenhoe, when the two were put together for the champion cup, the Sutton Maddock sheep being pronounced the best of all the short-wools. Mrs. Baker took the second prize for shearing rams, and Mr. Bradburne for old rams; while Mr. Keeling beat Mr. Smith for first in a remarkably strong class of ewes; the pens of the ewes, where Mr. Bradburne was first with his Worcester lot, being also generally excellent. Mr. Keeling claimed the best single ewe, and Mr. H. Smith the prize pen of lambs; while Mr. Horley and Mr. Yates did the most with the fat wethers. Mr. Morris, of Uleby, and Mr. Norton, of Harneage, who were the sheep judges, had a previous turn amongst the longwools, where Mr. Cresswell took the cup for the best of them with his two-year-old ram; and Mr. Spencer, of Snarestone (first and second for hearlings), Mr. Lynn, of Stroxton, Mr. Limber, Mr. Bosworth, Mr. Wood, of Mickie Hill, and Mr. Bird, of Bilton, were also distinguished on the prize-list, though the longwools by no means equalled the Shropshires, either in average or individual merit. The same two judges proceeded to the inspection of the pigs, the several classes of which mainly depended upon the entries from Yorkshire. Mr. Wainman took four prizes, in addition to the cup for the best pig in the show; Mr. Dickin, of Stockport, two; and Mr. Hickman, of Hull, two; the home winnings being confined to three prizes, which Messrs. J. A. Geary, R. Swinnerton, and J. Whitworth very equitably divided amongst them.

Mr. G. D. Badham, of Bulmer, near Sudbury, and Mr. Ladkin, of Lutterworth, undertook the horse classes of all breeds and ages, beginning with some young hunting stock. Their best three-year-old was a big, plain colt by Idas, the property of Mr. Tomlinson, of Pistern Hill: their first filly of the same age another plain, rather leggy one of Mr. Coleman's, and their choice of the two-year-olds a clever, useful colt, exhibited by Mr. Ward, of Nuneaton. There was a numerous entry of hunting brood mares, but with not many of any very great merit; the best being a fine lengthy mare of Mr. Townsend's, and the second the property of Mr. J. S. Clark, of Lutterworth; while an old grey of Mr. Congreve's, despite all her good stamp and character, received no notice amongst the commended. There were only two thoroughbred stallions sent for the two prizes, and Kentucky, by Mickey Free out of a daughter of the famous Pocahontas, had no difficulty in disposing of Cawood, a nag whose experience of the show ground does not, so far, tell much in his favour. The cart stallion premiums produced more competition; but, with Messrs. Yeomans and Brothers' Black Prince far before the rest of his company, and he took both the prize of his class and the piece of plate as the best of all the draught horses, while he has already been a frequent winner, and deservedly so too. A good black in colour, with great power, smart action, and a compact frame, the Black Prince's chief drawback would be a bit of a temper. The second-best was a clever old chestnut of Mr. Harker's; but not of the sort after Mr. Badham's heart, who looked about in vain for something of his own orthodox Emperor style and lineage. Either the competition or the actual good amongst the cart colts was not great; and in the

class of three-year-old fillies, one of the prizes was withheld, with Mr. Coxen, of Freeford, Major Woolaston, Mr. S. C. Pilgrim, Mr. Travener, Mr. Trnelove, Lord Shrewsbury, Mr. Hillier, Mr. Milhouse, and Mr. Bassett taking the other premiums for young things. One of the best, however, of all the classes in this section was that for cart mares in foal or with foals at foot, the entry being both numerous and creditable. Mr. May, of Elford Park, won with a great fine weighty bay mare; Mr. Saunder, of Cold Overton, claiming second for a good young roan with nice action, and some others being worthy of more notice than they received. For the best draught horse in work the Honourable Mr. Moreton had the money and Mr. Bosworth the commendation; a great weighty gelding of Mr. German's, with a deal of use and liberty about him, being drafted, as it struck us, a trifle too soon. The two prize hacks, Mr. Beale's mare and Mr. S. O. Smith's four-year-old were both worthy of their places, the latter with more promise than his mere second would yet warrant; and the eighteen or twenty hunters, left to the last, to jump the hurdles, numbered amongst them three or four of very superior qualifications. The two prize animals indeed, Mr. J. E. Bennett's Lady Constance and Mr. Cooper's chestnut four-year-old, had all the looks of going brilliantly over the Shires, and the mare has already won a steeple chase at Harborough; though, in the opinion of one of the judges, "too good to win a steeple chase." The chestnut horse was not in anything like form, and is bound to improve; though it was understood that one of the judges held out for Mr. Nurse's highly commended Irish horse, Mr. Berry Congreve also receiving a commendation for a plainish serviceable bay, with nothing like the breeding about him of either the brown mare or the white-faced chestnut, which rightly enough finished first and second; Mr. Bennett taking, in addition, the ten pound plate for the best of all the riding stock.

Howard's steam plough was doing good work in an adjoining field at eight inches deep, and finishing off the seven acres piece in about nine working hours; and a cultivator from the same firm was also exhibited in operation by Mr. Tyrrel, of Nuneaton, who has taken the premiums for the best system of steam cultivation at the two last meetings of this Society. The whole of the work was very satisfactory, with little or no time lost at the headlands. Samuelson took a prize for his reaper, as did the Beverley Works Company for theirs, but with the order of precedence in favour of the Banbury machine. Burgess and Key had also a new combined reaper and mower at work, but the action of this is scarcely yet perfected, and it would be premature at present to report upon its performance. Amongst divers other encouragements for skilled labour, one or two of the great rival houses met for the first time this autumn at Sparkenhoe, in a champion ploughing match, with George Brown once again the winner for his old masters the Messrs. Howards. The judges of implements, Messrs. J. Burbury, of Alveston, and Mr. G. A. May, of Elford, arrived at some further awards in this wise:—Best collection of agricultural implements, £10, Messrs. Matterson and Huxley, Coventry; and the collection of Mr. Clay, of Nuneaton, highly commended. New and improved implements not comprised in the collection: Hunt and Pickering, £1 for an iron roller; J. and E. Ison, of Ashby-de-la-Zouch, £1 for a cake breaker, drainage outlet, and other farm implements; Woods and Cocksedge, of Stowmarket, Suffolk, £1 for an improved Gardner's turnip cutter; Richmond and Chandler, and George Ball of North Kilworth, £1 each for implements exhibited; with Barrows and Co., of Banbury, and H. Mulliner, of Leamington, highly commended.

Mr. Newdegate, who took the chair at the dinner, had to apologise for the absence of many of the county people;

but he went on to speak very encouragingly of the grand feature of these occasions: "He hoped they would feel the sunshine with which they had been blessed that day, and which was now reflected in that tent by the presence of the ladies. The success of the Sparkenhoe meeting had been confirmed by the ladies. It was they who had knit the society together: it was they who had ensured for the members of the society a welcome whenever they had visited other districts: it was they who enabled them to leave their friends with the pleasant promise that in due course of time they (the ladies) would come back to them. The proof of his assertion was that other counties found the wisdom of the arrangement which the ladies had enabled them to make in this society. Warwickshire was converted, as the Lord-lieutenant had told them, and now Gloucester had followed the wise example of avoiding the

sulky festivities of unnecessary bachelorhood. This had been done by a connexion of theirs. Lady Emily Kingscote the other day was present at a meeting copied from their own, and teaching the agriculturists of the Cotswold Hills the great wisdom they had long practised of combining instruction with all the advantages of social intercourse; for nothing had contributed more largely to the success of that society than the wise maxim copied from an old rule, of business first and pleasure afterwards. The committee met to discuss all the important business of a show like that, but they had wisely determined to reserve one holiday. It was a day in which, contemplating the results of past exertions, they might enjoy the social intercourse and support and encouragement of all who were interested in agriculture."

LEICESTERSHIRE AND WALTHAM AGRICULTURAL SOCIETY.

The annual show of stock, poultry, implements, &c., in connection with the above-named society took place on the race-ground, at Leicester. A large portion of the race-course was enclosed for the occasion with boards, and a better or more picturesque spot could scarcely have been selected. The cattle and stock were exhibited under wooden sheds, and the poultry and cheese (of which there was also an exhibition) in tents. The implements and roots occupied uncovered spaces on the ground.

The classes for oxen, cows, heifers, &c., were not so well filled as could have been desired, but the animals shown were of a very superior order, and were much admired.

The classes for sheep and pigs were scantily supplied. Harvest operations doubtless interfered with farmers sending their stock to these departments. The show of horses was large, and some very fine hunters, &c., were brought into the field. The implements shown were mostly from the establishments of Leicester manufacturers, whose specimens were very creditable.

JUDGES OF HUNTING AND HACK HORSES.—W. A. Pechin, Esq., Edmondthorpe Hall; Fitz Oldacre, Esq., Newbold Grange; and Mr. W. Denham, Kegworth.

OF AGRICULTURAL HORSES.—Mr. P. Rippen, Warraby; Mr. T. Wright, Wanlip; and Mr. F. Lakin, Lutterworth.

OF CATTLE, SHEEP, AND PIGS.—Mr. H. Mackinder, Langton Grange, near Spilsby; Mr. John Leighton, Osgodby, near Scarborough; and Mr. Charles Clarke, Scopwick, near Lincoln.

The following is the award of the prizes:—

BEASTS.

(By the Mayor and Corporation of Leicester.)

For the best ox, under five years old, £15, Sir W. de C. Brooke, Bart.; second, £5, the Right Hon. Earl Spencer.

(By T. Frewen, Esq.)

For the best ox, under four years old, £10, Mr. R. H. Chapman, of Upton.

(By the Right Hon. the Earl Howe.)

For the best Scotch, Welsh, or Irish ox or spayed heifer, £5, Mr. B. E. Bennett, of Marston Trussell Hall.

(By the Licensed Victuallers' Society of Leicester.)

For the best fat cow or heifer, £8, C. W. Packs, Esq., M.P.; second (by E. B. Farnham, Esq.), £5, Right Hon. Earl Howe.

(By the Right Hon. Lord Berners.)

For the best fat heifer, under four years old, £5, second (by the Society), £3, C. W. Packs, Esq., M.P.

(By the Right Hon. Lord Berners.)

For the best dairy cow, a silver cup, value £5, C. W. Packs, Esq., M.P.; second (by the Society), £3, Mr. John Lyns, of Broxton, near Grantham.

For the best in-calf heifer, under three years old, £5, Lady Emily Pigot; second, £3, Earl Spencer.

For the best heifer, under two years old, £4, Mr. John Lyns; second, £2, Lady Emily Pigot.

For the best bull, above ten months and under two years old, £5, C. W. Packs, Esq., M.P.; second, £3, Mr. J. B. Leadbetter, of Thorpe Satchville.

For the best bull, of any age, £4, C. W. Packs, Esq., M.P.; second, £2, Mr. John Gee, of Welford.

SHEEP.

(By the Mayor and Corporation of Leicester.)

For the best pen of five long-woolled fat wether sheep, under 20 months old, open to all counties, £5, the Hon. Col. Lowther; second, £2, Sir W. de C. Brooke, Bart.

(By the Right Hon. the Earl Howe.)

For the best pen of five long-woolled fat wether sheep, under 20 months old, bred and fed in the county, £5, Lord Berners.

For the best pen of five short-woolled or cross-bred fat wether sheep, under 20 months old, £3, Mr. Thomas Grecock, of Stapleton; second, £2, Mr. Abraham Nunn, of Ashby, Parva.

For the best pen of five long-woolled ewes, £10, the Hon. Col. Lowther; second (by the Treasurer), £5, Mr. John Shaw, of Hunsbury Hill.

For the best pen of five long-woolled Theaves, under 20 months old, £10, Mr. John Shaw; second, £5, the Hon. Col. Lowther.

For the best pen of five short-woolled Ewes, £3; second, £2, Mr. J. H. Bradburne, of Pipe Place, near Lichfield.

For the best pen of five short-woolled Theaves, £3; second, £2, Mr. J. H. Bradburne.

For the best pen of six long-woolled ewe lambs, £5, Mr. Henry Bond, of Misterton; second, £2, C. W. Packs, Esq., M.P.

For the best long-woolled ram of any age, £5, Mr. John Lyns, of Stroxton.

For the best long-woolled shearing ram, £5, Mr. J. Lyns.

PIGS.

For the best in-pigged or suckling sow or gilt, £5, Mr. Job Farmer, of Brannstone Frith; second, £3, Mr. John Beck, of Leicester.

For the best boar, £5, Mr. Wm. Carver, of Ingersby.

For the best fat pig, under 12 months old, £3; second, £2, Mr. John Sammons, of Ashby Magna.

For the best fat pig, under 18 months old, £3, Mr. J. B. Leadbetter; second, £2, Mr. Wm. Benakin, of Rearsby.

HORSES.

(By the Right Hon. the Earl of Stamford and Warrington, W. A. Pechin, Esq., and Mr. J. E. Bennett.)

For the best hunting gelding or filly, four years old, £30, Mr. Wm. Coleman, jun., of Long Clawson; second (by W. W. Tailby, Esq.), £5, Mr. G. W. Coleman, of Great Glen.

(By Captain Baillie.)

For the best hunting gelding or filly, two years old, £5, Mr. G. W. Coleman.

(By His Grace the Duke of Rutland.)

For the best mare, calculated to breed hunters £10, the Right Hon. Lord Berners.

For the best hack, £10, Mr. S. Ashwell, of Barrowby.

(By the Right Hon. Lord Berners.)

For the best gelding or filly, two years old, £5, Mr. Joseph Norton, of South Kilworth Lodge.

For the best gelding or filly, one year old, £5, Mr. Thos. Blockley, of Aylestone Lodge.

For the best in-foal mare, £10, Mr. L. Richards, of Glenden Lodge, Kettering; second, £5, Mr. Wm. Saunders, of Cold Overton.

For the best cart stallion for agricultural purposes, £10, Mr. Wm. Clarke, of Wycomb; second, £5, Mr. John Manning, of Orisbury.

(By the late Major the Hon. H. L. Powys-Keck.)

For the best foal, £5, Mr. Lewis Richards.

EXTRA STOCK.

(By the Society.)

For the best breeding cow or heifer, £5, C. W. Packe, Esq., M.P.

(By C. W. Packe, Esq., M.P.)

For the best fat beast, a silver cup, value £5 5s., Sir W. de Capel Brooke, Bart.

For the best pen of five Leicester or long-woolled sheep, a silver cup, value £5, Mr. Thos. Burdett.

(By the Right Hon. Lord John Manners, M.P.)

For the best cow exhibited by tenant occupiers of not more than twelve acres, £3, Joseph Poultaey, of Braunstone.

The usual dinner took place on Wednesday, and was attended by a very large company. The Mayor, Mr. Toller, presided, and was supported by Lord Berners, Mr. Heygate, M.P., the Hon. Mr. Moreton, the Rev. Mr. Hopkins, Messrs. Freer, Miles, Addison, Rev. Mr. Smallwood, &c.

Mr. HEYGATE, in returning thanks for the House of Commons, in the course of his observations said: "There was one subject which he thought of such importance to agriculturists that he felt bound to make some allusion to it. He was not a very great agriculturist himself, but he felt very great interest in its prosperity; and nothing, he thought, would be more useful to those who were practically engaged in it than that there should be established a good system for the collection of agricultural statistics (Hear, hear, and no). He wished them to consider whether the time had not now arrived when the nation should be put in possession of that information with regard to the cultivation of the soil which would show the agricultural progress of the country from year to year; which would show the increase or decrease of its agricultural wealth; which would give to its population that information which was possessed and highly appreciated by the population of almost every country in Europe besides our own, and which we had remained so long without, entirely from what he conceived to be prejudice (Hear, hear, and no, no). He knew very well that as soon as the words "agricultural statistics" were pronounced, there were some among them who would be disposed to fire up, and to say, "No, let us have no interference with our private affairs." But he wished to persuade them that although there might be some good, there could not by possibility be any harm in the collection of agricultural statistics. What harm could there be in collecting this information about the state of the cultivation and the amount of the produce of the land? Information was valuable on every subject; it was always useful to throw light upon everything. Why, then, should this subject be shrouded in darkness, especially when he could prove it to them that agricultural statistics could be collected without the smallest interference with private property or the invidious exposure of the affairs of any one? It was now eight years since a committee of the House of Lords, composed of individuals by no means unfriendly to the agricultural interest, reported that it was a matter of national importance and utility that there should be an organized system of agricultural statistics; that among the various classes who would be benefited thereby none would gain greater advantages than the agriculturists themselves; and they

further reported that, inasmuch as it was a matter of national interest, the requisite expenses for the collection of agricultural statistics ought to be borne out of the national exchequer. The machinery for their collection need not be of a very complicated character, for if they could obtain two returns only they would gain a great deal of valuable information. In the first place, what they would require every year was an account of the acreage under cultivation, setting out the acreage of the different white and root crops; and, in the second place, they would require an account of every description of stock, which might be easily obtained in the spring. If they could obtain those returns annually they would be able to form a sound judgment with respect to how far the country was advancing or going back in respect to its material wealth. If, then, information was all that was wanted, what objections could there be to their making attempts to obtain it? Nobody would deny that the information which would be obtained from agricultural statistics was useful; nobody would, now-a-days, say it was wrong to obtain it with the consent of the farmer, if they could. He thought, then, that he was right in supposing that the whole objection which had hitherto been manifested in this country to the collection of agricultural statistics arose from the fact that the measures proposed for that purpose had contained clauses making them compulsory; and, in the second place, because it had been proposed, small as the payment was, to charge it upon the county rates. He thought, however, it was now beginning to be admitted by all who had considered the question that the fairest way, considering that the information would be valuable to all classes, was to make it a national charge. In Ireland this information was now collected annually from something like 600,000 holdings, and it was collected throughout the whole country without a dissentient voice. They everyone liked it, and every person interested in the cultivation of the land felt bound to have a copy of the statistical tables, so indispensably necessary had they become. Such returns were of great importance in debates of the House of Commons; and, in point of fact, the whole character of the debates on agricultural questions very much depended upon the nature of those returns. Only last year the Registrar-General of Ireland congratulated the country on the increasing popularity of agricultural statistics; and the facts he laid before the country abundantly showed that not only the manufacturers, who were a small class in Ireland, but the landowners and tenant farmers were alike anxious to press forward most earnestly the collection of those statistics; and those who now heard him might depend upon it that if such collection had been found in the smallest degree injurious to the agricultural interest, not only would they not have been persisted in, but the loudest complaints would have been heard that such an experiment should have been tried at the expense of the Irish farmers (Hear hear). He would only quote one fact to show how completely isolated we in this country were in this respect. Agricultural information, as he might call it, was possessed by France, by Belgium, by Holland, by Prussia, by part of Austria, by Saxe Coburg and Gotha, by Spain, by Norway and Sweden, by North America, by our Australian colonies, and last, but not least in importance, by Ireland. We were (as had been stated by Mr. Wren Hoskyns) on this subject, secessionists from the body corporate of nations, so thoroughly had we neglected a subject of such importance to the nation at large. At the same time, he quite admitted that it was a question mainly for the consideration of the farmers; for, depend upon it, that if the information was not wished for by a very large body among the farmers themselves, the country would never have it at all. But he was himself of opinion that the agriculturists of this country were of far too great intelligence to hesitate much longer on the subject, and that the country might very soon look forward to being in possession of such information as would enable it to say how far the farmers of England were capable of providing it with food. Strange as it might sound to some in this age of statistics, it was a positive fact that it was impossible for anyone to say whether the growers of grain in this country were supplying 5 per cent. or 50 per cent. of the food of the nation (No, no). It might not be a matter of very great consequence in time of peace, but they might depend upon it that such information would

become of vital importance in the event of a war, especially if what he hoped would never occur took place, and we were, to a great extent, to lose the mastery of the sea. Entertaining views of so strong a nature on this subject,

he had thought it not out of place to attempt to impress them upon agriculturists on the present occasion, and he sincerely hoped to see an efficient organization for the collection of agricultural statistics ere long (Hear).

ROYAL AGRICULTURAL SOCIETY OF IRELAND.

MEETING AT KILKENNY.

The Irish show is usually the wind-up of the "Royals," and that for the present year, which was fixed for Kilkenny, a town rejoicing in "fire without smoke, water without mud, and streets paved with marble," began on Wednesday last with the judging, terminating on Friday evening. Of course the Lord-lieutenant was there—it could not have been a show without him; and if full bumpers and lusty cheers could secure the realization of the standard toast of all Irish meetings, "Prosperity to Ireland," we should never hear more of distress in the "Emerald Isle."

There were no English or Scotch exhibitors in the Shorthorned sections; so that, with one or two exceptions, the winners had already become favourably known, either at the shows of the Royal Dublin Society or those of the Royal Agricultural itself. Messrs. Wetherell, Woods, and Wiley went over specially, to settle matters; and their decisions seemed to give general satisfaction, unless in some cases of little importance.

The first prize in the aged Shorthorn bulls was taken by Soubadar, well known as a winner when shown by his breeder Mr. Richardson, and by his former owner, the late Mr. Copping; at whose sale Mr. Butler, who had him at Kilkenny, bought him. The gold medal, as the best of all the prize bulls of any age or breed, was also awarded to him. At the Royal Dublin Spring show, last Easter, he was beaten by Royal Butterfly; but he has now regained his position as the premier bull of Ireland. Soubadar has a good breast and a capital rib and loin, with good haunches; and his rich colour is very much in his favour. He threatened at one time to be rather patchy, but he is not so as yet; in fact, he keeps wonderfully even. One of the Stackhouse bulls, Paterfamilias, now belonging to Mr. Cooke, New Ross, Co. Wexford, was second, and much in favour, with his grand fore-end and good rib.

We did not like the prize two-year-old bull at the Royal Dublin Spring Show, and said so in our report of that meeting, and we did not like him any better when he was shown at Kilkenny, where he was again put first, with his half-brother as second, just as he was second in spring. There is not a doubt but that Mr. Torr's Grey Gauntlet should have beaten both of them last Easter, but that capital bull was not shown at Kilkenny by his present owner, a gentleman belonging to Wexford. Lord Waterford's bulls—that is the prize pair—are large-sized cattle, but inclined to coarseness. Mr. Barcroft got a commend for his Sittyton Lord Aberdeen—a good bull, if he were but a little fuller in the girth. The first yearling of the Dublin Spring Show was also first at Kilkenny, having been shown by his new owner, Lord de Vesci, who bought him, in April, from Mr. Crosbie. He is a lengthy, rich bull, with a deal of sweetness, and a rare handler, his weak point being a slightly bare back. Lord Waterford's thick, white bull Anthony, distantly related to the Lamp of Lothian blood, of which splendid and very lucky bull the first yearling Crown of Lothian is a son—a sweet, but, in the opinion of some an undersized yearling, bred and shown by Mr. Tynte, the breeder of the Irish prize bulls Sir Colin and Clydesdale—was commended; while in point

of pedigree, as well as other respects, we would put him miles before the second bull. There were some capital bull calves shown, Mr. Crosbie taking first and second, with a pair showing that nice quality which belongs to his herd ever since he got Lamp of Lothian from Mr. Douglas.

The first prize in the cows was awarded to Mr. Ball's Recherché, a daughter of Monk, and, with the Monk ribs, has a grand constitution, which has carried her over the effects of successive trainings and winnings, leaving her in high condition, a useful breeding cow. The second cow was a ten-year-old daughter of Gold Dust (11536); but, notwithstanding her age, Bluebell keeps her place exceedingly well, having won several times since her present owner, Mr. Bloomfield of Waterford, got her. Her shoulder is perfection, and her handling superb. The prize cow of the Dublin Spring Show, Mannelita, a granddaughter of Rose of Autumn, and a great massive cow, only reached the honour of a "commend"; while Mr. Jones' Vine Leaf, of the Sizergh blood, was highly-commended. Mr. Anderson's Lady of Avenel, white as snow, and with her beautifully arched ribs and magnificent chest, was placed as the first three-year-old heifer of the show, followed by Mr. Barcroft's Lucia, a get of Cruickshank's First Fruits. Lucia's loins and quarters are very good, and so is her handling; but she wants the fore-end and style of Lady of Avenel, whose breeder and owner had her quite as beautiful half-sister, Rose of the Suir, placed first in the two-year-olds, seconded again by another of Mr. Barcroft's lot, the stylish Mysie, a recent importation from Shethin.

The yearling heifers were the flower of the show; and the best of the lot, Mr. Ball's Woodflower, was the heifer which beat Towneley's Royal Butterfly's Duchess at the Dublin show last April. Woodflower is a thick, symmetrical heifer, well developed, and well-deserving her place as a prima-donna anywhere. Mr. Barcroft had a gay daughter of Duke of Geneva, out of a Booth-blooded cow, put second; and Mr. Jones' heifer by Master Harbinger is just the cut of a grand, useful style of cow. That gentleman's half-sister to his prize heifer was commended, and Lord Waterford got a high commendation and commendation for a pair of the Curraghmore lot, come of winning dams. Mr. Crosbie got first with his heifer calf, and Mr. Ball second; but a deal of people preferred a highly-commended calf sent by Mr. Allan Pollok to either, on account of superior hair, his superior back and loins. Time will tell how the three will stand twelve months hence, and in what manner their respective early promise shall then be carried out.

Of late years several purchases have been made by Irish breeders at crack sales of Herefords, and at some of the Irish shows that famous breed has been well represented; but at Kilkenny Mr. Reynell was the only exhibitor, sending forward, however, something worth looking at, in his very even and sappy yearling bull calf, and her roomy dam, both from the herd of the late Lord Berwick. The cow was Cronkhill Lottery, got by Lottery the 2nd, and the calf was by Lord Berwick's Cropper. Both the prizes for which those animals were entered were awarded to

them. In like manner Mr. Owen was the sole exhibitor in the Scotch polled sections; although others, Mr. Allan Pollok for instance, have good specimens of those useful breeds. Mr. Owen's bull, a lengthy animal, of a hardy constitution, suiting him for the locality in which he is placed, was bred by Sir John Sinclair, Scotland; and Mr. Owen's cow and heifer were of the best Angushire blood, as represented in the Polled Herd Book. Fresh Devon blood is required by those who adhere to "the red line" in Ireland. Lord Charlemont and Mr. Davis, Thomastown, were the winning exhibitors; but of the two we preferred those sent by his lordship, as being not only the best quality, but also the best bred. Ayrshires do not seem to be a favourite in the Kilkenny district, although tolerably numerous further south; and it was Mr. Borthwick, from near Belfast, who took the bull prize with the same animal he showed and won with at the Limerick Royal last year. Mr. Borthwick's cow, a very handsome Ayrshire, was disqualified, sorely against the wish of the judges, who believed they could not do otherwise, owing to some of her spins having gone wrong. They were compelled, therefore, to award the prize to a strong and rather coarse cow, bred in Scotland, belonging to Mr. Carroll, Mullinarat. Mr. Borthwick, however, came in first in the three-year-old heifer section, with a very sweet-made animal, beating a neat heifer which had recently won a challenge cup of the Cork society, and also another Scotch-bred heifer. In fact, all the heifers in the section had been brought from Scotland. The Ayrshire breed deserves to be encouraged in Ireland, especially in some of the dairy districts where the land is inferior; but those who intend to go into it should study the breed as it may be seen at some of the West of Scotland shows—for example, that of the Glasgow Agricultural Society, or at the shows of the Highland Agricultural Society. The Highland sections at Kilkenny were totally unfilled, excepting a dun cow sent by Lord Charlemont. The show of Keries was excessively poor, and the prize cow but a middling specimen of the breed. Lord Charlemont's two-year-old bull, the winning one, and Mr. Cusack's bull of the same age, were, however, very good. The latter was bred by Lord Charlemont, and though unsuccessful at Kilkenny had been a winner at Dublin and Limerick. Mr. Cusack won with his two beautiful heifers, one of which was a granddaughter of his Battersea Kerry.

The prize Leicester shearing ram of Worcester, now Mr. Owen's property, kept his place as the first shearing at Kilkenny, as well as in being the winner of the long-wooled Cork challenge cup; but the second Worcester shearing, bought at Mr. Sanday's sale by Mr. Turner, only reached a high commendation, his place of second being filled by a thick good-backed sheep belonging to Mr. Watkins, Woodfield, Droitwich, which had been shown at Worcester, but passed over unnoticed. Doctors differ, and so do show-yard judges. Mr. Marris, Lincolnshire, got the third prize with a compact sheep, and Mr. Owen had a very superior one, bred by himself, highly commended; and in the aged section he took both first and second prizes with a pair of two-shear rams, with good frames and capital fleeces; Mr. Longfield, County Cork, placing one of his pair of entries third in the section. Mr. Thunder, County Meath, got a high commendation for one of his rams, leaving the English importations in this section altogether unnoticed. The Irish Royal has given up breeding ewes as part of its shows, as it was alleged that it was generally barren ewes which were brought out on such occasions; and the only female sections are those of shearing ewes and ewe-lambs. Mr. Turner, Exeter, got the first prize, with a pen of shearing ewes neither so equal nor so sweet a lot as Mr. Owen's pen, which was placed second. In the ewe-lambs, Mr. Mowbray, Queen's County, was first, and Mr. Owen second, both being good lots.

Mr. Beale Browne took nearly all the prizes in the long-wooled sections not qualified to compete as Leicesters, with his Cotswolds. He won, in fact, all he could, for in some of the sections he had not a sufficient number of entries to compete for all the premiums. We thought that he was opposed to "sculpturing," but we suppose he confines his opposition merely to theory, without reducing it to practice. Mr. Carroll, Nenagh, and Mr. Low, Tipperary, were also successful competitors in long-wooled—not being Leicester—sections.

Mr. Marris and Mr. Scott Skirving showed several pens of neat Southdowns, three firsts and two seconds being taken by the first-named gentleman, whose shearing ram was an uncommonly symmetrical and compact sheep; while Mr. Skirving came in for a second with his two-shear ram.

The award of the Cork Challenge Cup, given for the best shearing ram in the short-wooled classes—Southdowns and Shropshires being generally the breeds which compete for it—at the Limerick Royal last year, gave rise to considerable dispute afterwards, and it is only recently that the matter was finally settled. The shearing Southdown rams entered for Limerick did not make their appearance, consequently there was only one sheep to compete, namely, the shearing Shropshire ram shown by Mr. Broughton. It appears that the judges had recommended the withholding of the cup; and when the cause of this was inquired into, the reply was, "No merit." It turned out, however, that the ram in question had been the second ram at Battersea, procured by Mr. Broughton to supply the place of the first Battersea shearing, which Mr. Broughton had secured in the first instance, but which had died before he could be sent to Ireland. When the previous history of the Limerick prize ram was pointed out, the cause of withholding the cup was then stated to be, "No competition"; and in the after-discussion at the Council board, of Mr. Broughton's protests, "no merit" and "no competition" came so often up, that it was evident the Council did not exactly know which ground of rejection should be taken. At one meeting of Council the cup was virtually given to Mr. Broughton, who argued that the conditions did not imply that want of competition could bar his right, and that his ram being the best shearing ram was entitled to it. Then the matter was put off to another meeting, and so on until at last a letter from Mr. Broughton's solicitor brought it to an end by inducing the Council to refer it to the opinion of the Solicitor-General, according to Mr. Broughton's suggestion, who, considering the purely legal view of the question, with reference to the wording of the conditions, gave it against Mr. Broughton. The decision, though it caused a revision of the list of judges, has not been beneficial to the Society; for it not only prevented Mr. Broughton from securing the top of the Shropshire class at Worcester, which he would have done, were he assured of competition, but it also prevented some English exhibitors from sending over sheep to Kilkenny. The competition in the shearing Shropshire rams lay between Mr. Broughton and Mr. Hamilton, who both showed sheep bred by themselves from the best Shropshire blood. We scarcely think it could be possible to get two more equal sheep, and both were really of a splendid character, reflecting the greatest possible credit on their breeders—much more so, in fact, than if either or both had been merely imported. The only point in which Mr. Hamilton's ram had the advantage was in a moister fleece than that of Mr. Broughton's ram, and this decided the section prize and the cup award. There was a good deal of discussion as to that particular point, and reference was occasionally heard as to the peculiar virtues of "thine oil, Macassar!" The other Shropshires exhibited were very good, particularly Mr. Hamilton's pen of immense shearing ewes. The cup belonging to this class creates a

great deal of interest, and as Shropshires are now established favourites in Ireland, we hope to see some of the Shropshire breeders entering the Irish lists in *proprie persona*. Let us tell them it is worth their while to do so.

The draught horse first prize in the aged section was awarded to a very fine Clydesdale, recently imported into Ireland by Mr. John Mill, the owner of the former winner Lord Clyde. His new horse is a compact, powerful animal, of a bright bay colour. A cross-bred three-year-old stallion, belonging to Mr. Mooney, got the first prize in his section, being put before a very good prize bred Suffolk, and we were told the cross bred got the medal also as the best stallion in all the sections, which, if true, was a bit of queer judging, to say the least of it. A beautiful Clydesdale mare belonging to Mr. Mill got the prize in her class, and the challenge plate, beating, among others, a grand mare of the same breed, belonging to Mr. Whaley. Mr. Waldie, Mr. Allan Pollok, and Mr. Donagh were the winners in the filly sections, with very promising animals. The Croker challenge plate for the best weight-carrying thorough-bred stallion went to Yorkshire, having been taken by Mr. Groves' Claret, bred by Mr. Osbaldiston, and got by Touchstone out of Mountain Sylph.

Mr. Joyce, a successful exhibitor at Worcester, was the principal prize winner among the Berkshire swine, some of his entries being uncommon animals for substance and quality. The show of butter was well filled. Some of the lots to which prizes were awarded were extremely

high coloured, while others were quite the opposite. Ireland is not a cheese-producing country, though we see no reason why it should not be so, and there were only two entries of that article, one of which was fair, while the other was very indifferent. The implement yards were tolerably well filled, and the entries included those of several English exhibitors. Messrs. Howard had their cultivating apparatus at work near the town, but so very foul was the ground from squitch, &c., that the cultivator got frequently choked. It did its work well, however, notwithstanding the disadvantages under which it laboured; and all who saw it at work were loud in their praises of it. Mr. Malcomson, of Portlaw, purchased the tackle, intending to use it in the cultivation of his newly reclaimed slob lands near Waterford. Among the other entries were Bentall, of Maldon; Eastwood, Blackburn; Kennan and Sons, Dublin; Morton, Liverpool; Perry, Glasgow; Childs, London; Byrne, Shanballymore, Co. Cork, with a new and useful-looking implement for cutting and removing weeds out of pastures, &c.; Barrows and Carmichael, London; Cambridge, Bristol; Toole and Co., Dublin; Young, Ayr; Bradford, Manchester; Turner, Ipswich; Greening and Co., Manchester; M'Kenzie, Cork, who had ninety-two articles on his stand; James, Cheltenham; Bowles, Dublin; Hill and Smith, Brierley Hill, Staffordshire; Garrett and Sons, Leiston Works; O'Neill, Athy; Richmond and Norton, Liverpool; Barrett, Exall, and Andrewes, Reading; Radcliffe, Manchester; Ashby and Co., Stamford; Smith, Thrapston, &c., &c.

MANCHESTER AND LIVERPOOL AGRICULTURAL SOCIETY.

The following awards have been made for this year:—

BEST CULTIVATED FARMS.

To the tenant and occupier of not less than 150 acres, £10, Mr. John Fairhurst, Woodlands, near Ormskirk.

To the tenant and occupier of not less than 100 acres and under 150, £8, Mr. H. Clayton, Aintree, near Liverpool.

To the tenant and occupier of not less than 50 acres and under 100, £6, Mr. James Ashton, Speke, near Liverpool.

To the tenant and occupier for the best managed dairy or grazing farm of not less than 200 acres, £10, Mr. W. Whitlow, Crouchley Farm, Lymm.

To the tenant and occupier for the best managed dairy or grazing farm of not less than 100 acres and under 200, £8, Mr. Charles Davenport, Stanthorne, near Middlewich.

To the tenant and occupier for the best managed dairy or grazing farm of not less than 50 acres and under 100, £6, Mr. John Rigby, Lower Whitley, near Northwich.

To the tenant and occupier of not less than 150 acres in the high-lying portion of the society's district, Mr. H. Neild, Worsley Grange, near Manchester.

DRAINING.

To the tenant of not less than 150 acres, who shall drain the greatest quantity, £8, Mr. Joseph Cliffe, Lower Whitley Hall, near Northwich.

To the tenant and occupier of not less than 100 acres and under 150, who shall drain the greatest quantity, £4, Mr. John Kilshaw, Cow-lane, Great Sankey, near Warrington.

To the tenant and occupier of not less than 40 acres and under 70, who shall drain the greatest quantity, £3, Mr. John Bowker, Aston, near Northwich.

To the tenant and occupier of a farm of not less than 25 acres, who has had the greatest quantity of draining done for him upon his farm by his landlord, and upon the cost of which he has agreed to pay interest, £2, Mr. T. Houghton, Oxton-hill.

SUBSOILING.

To the tenant and occupier of not less than 100 acres who shall subsoil-plough the greatest quantity, not less than 10 acres, £5, Mr. John Griffiths, The Baka, near Hawarden.

IRRIGATING.

To the owner and occupier who shall irrigate the greatest quantity, the Society's silver medal, Mr. Harold Littledale, Liscard Hall, near Birkenhead.

LAYING DOWN LAND TO GRASS.

To the tenant and occupier of a farm of not less than 150 acres who shall, in proportion to the extent of land capable of arable cultivation on such farm, lay down the greatest quantity of grass, £5, Mr. John Overton, Chapel House, Speke; and the Society's medal to Sarah Jenkinson, Speke.

To the tenant and occupier of a farm not less than 100 acres and under 150 who shall lay down the greatest quantity to grass, £4, Mr. Gilbert Halsall, Halebrook, near Warrington; and Mr. R. J. Owen, Halebrook, £3.

To the tenant and occupier who shall construct the best tank or reservoir for liquid manure, £3, Mr. J. Cliffe, Whitley Hall, near Northwich.

HEDGES.

To the tenant and occupier of a farm of not less than 150 acres who shall at his own expense eradicate the greatest length of old hedges for the purpose of laying out his fields in a form and size best adapted for the cultivation of his land, £5, Mr. J. Cliffe, Whitley Hall.

To the tenant and occupier of a farm of not less than 50 and under 150 acres who shall eradicate the greatest length, £4, Mr. John Kilshaw, Cow-lane, Great Sankey.

To the tenant and occupier who shall have raised after planting in one season the greatest length of white thorn hedge, £5, Mr. Kilshaw, Great Sankey.

WHO KILLED COCK-SPARROW?

Some two or three years since, we were present at an amusing meeting of the Society of Arts, where the object of the lecturer was to impress the advantage of acclimatizing all kinds of foreign beasts, birds, and fishes. We are not quite sure but that the learned gentleman dwelt upon the beauties of the Bengal tiger, or the immense gratification it would be to have the hippopotamus coming up between Putney and Mortlake, while the ostrich stalked through the market-gardens of Barnes and Brentford, and parrots and monkeys chattered a welcome from their comfortable fastness amidst the horse-chestnuts of Hampton. Pleasing a picture as this is to the imagination, delightful as it might be to chevy the wild boar through Windsor Great Park, or to race a herd of buffalo over the Wiltshire Downs, it is still doubtful whether, with the innate spirit of Englishmen, we are not too apt to prize anything or any-body that may happen to come from other climes. A prima donna would never tell half as well amongst us as a "Miss" as she will as a "Made-moiselle;" and a Count or Baron carries an introduction in his very title, that a simple squire or an educated gentleman would often seek in vain for amongst his own people. It is, perhaps, only when we lose them that we begin to thoroughly appreciate our own homely friends and companions, as nothing is said to have moved the emigrant more than when he first heard the skylark carolling up to heaven with the old English pipe thrilling through the wild prairies of Australia. There the little songster is regarded as a blessing; here he is too commonly treated as a nuisance. With the exception of the pheasant and the partridge, to which we sacrifice with as blind an idolatry as ever did the heathen of old to their sacred geese or deified pea-fowl, there is scarcely a bird that flies but that has a price upon his head. Master and man, landlord and tenant, are alike at war with the feathered tribes. From the keeper who shoots the solitary owl to the lad who nets the gregarious sparrow, there is still the same inclination, or rather direct encouragement, to destroy. One, indeed, would think that the plagues of the land were not so much grubs and insects, as rooks and finches; and that a man is regarded proportionately as a benefactor who protects the interests of flies and snails by a systematic onslaught against blackbirds and thrushes.

The world, however, is gradually coming to a different way of thinking. The keeper's tree, so ostentatiously adorned with spread-eagled pies, jays, owls, and daws, is regarded with anything but that same feeling of satisfaction by the public as it may be by the man and his master. Sportsmen are apt to fancy there may be a fox's unhallowed remains fostering the roots of that too fruitful elm, as the cottager to believe that the spirit of the family cat still flits uneasily through its ominous shade. Then, again, the hero of the Sparrow Club is a hero no longer, flattering though may be the address of the president, as he hands over the ill-won honorarium to the pitiless slayer of his thousands. In fact, all this wholesale slaughter, all this paying of persons to exterminate owls and rooks, and sparrows, and finches, may be in reality tending to a deal more harm than good. Instead of sighing for the cheerful ditty of the laughing jackass or the stately presence of the pelican of the wilderness, suppose we look a little closer into the actual merits and uses of what Bewicke so fondly classified as British birds. And is it all quite barren here? Has the owl no other object than to be a keeper's mark? Shall the starling's note sound

but as the signal for his immolation? Are finches only to be counted, like hobnails, at so much a thousand, and rooks to have no other aim than to fill up a spring pasty? If it be admitted that pheasants and partridges be the great gods of the feathered life, and that rats, mice, grubs, beetles, and wire-worms be all very excellent things in their way, then let game-preservers and tom-tit destroyers go on as they have gone, by all manner of means. But if, on the other hand, there be something further to consider than the safety of a pheasant's egg or the value of a bunch of currants, then it may be as well to reflect a little on the courses which we have been so mercilessly pursuing. Let the farmer calmly ask of himself whether he should rank the barn-owl as a friend or foe; and if, on consideration, they can come to side together, then let the one stand by the other as firmly as he would to his child's kitten or his shepherd's dog. Again, is that army of black Brunswickers that he sees encamped upon his freshly-turned furrows really aggressive or protective? Are they doing him more harm than good? and is the voice of the bird-boy at so much a week so much of a service after all? Or, to come nearer home, are the sparrows and finches, fruges consumere nati?—are they such epicures as to peck at nothing but the best heads of corn and the finest berries of fruit? A gardener will probably tell you that he must keep these little miscreants off, while he employs all sorts of artificial means to free his plants and crops from such curses as moths, flies, grubs, and other destructive insects. But the case of the farmer is somewhat different; and as he needs more protection in this way, he must look to the balance of nature to afford it him. On the occasion of the discussion at the Central Farmers' Club on the over-preservation of game, the author of the opening paper said—"Keepers may profess to kill rats and hedge-hogs, and perhaps they do when they can find them; but they destroy far more systematically the great enemies of such a class of depredators. They shoot the terriers that kill the rats, they trap the cats that kill the mice, and they wage war against the hawks and owls. The balance of nature is, as it were, upset; and only that the farmer should suffer more and more from such a revolution." It may be said, fairly enough, that unfortunately the farmer has little power in preserving any such a balance, so far as restricting the keeper is concerned; but he certainly has in other directions. The very text-word of this question might be taken as *when he can find them*. The keeper will kill rats and hedge-hogs *when he can find them*; but, with all his contrivances and efforts, he will never be able to keep them down half so effectually as their natural enemies, the cats and owls and terriers. The same argument is equally susceptible of an application as regards the uses of the smaller birds. Science and care may afford a man some help against the attacks of the slug, the fly, and the worm, and he will kill them *when he can find them*. But their sworn foes, whose very business of life it is to follow them up and root them out, are the rooks and the finches and the sparrows that we hoot off our farms as the worst of trespassers, or whose heads we gladly buy up at so much a hundred. Is this wise? Is it right? We will not ourselves put the question, yea or nay, either way; but what we would impress is that the subject has not, so far, had that careful consideration it should have had from the cultivators of the soil. There is no doubt whatever but that the keeper inflicts immense injury on the country when engaged in slaughtering every bird or beast that he fancies might suck

a pheasant's egg, or eat up a young partridge; and the point here is whether the farmer has not been blindly adopting very much the same principle? There may occasionally be an inconvenient swarm of sparrows or finches round a cherry-tree or currant-bush; but is the thorough extermination of these small birds altogether advisable, as the rules of the local clubs would seem to insist upon? We think not; and we have the more reason for thinking so from the publication of an admirable letter in the *Times*, to be found in another column, in which the food of every bird, from the long-eared owl to the smallest finch, is carefully classified. As the work of a French gentleman, the several ingredients of the several crops may not quite tally with our own notions or experience, but the whole article is eminently suggestive and practical, and on these terms we would call to it the serious attention of the farmer. We have to thank Mr. Wilson for not missing so interesting an entry in the Great International Exhibition.

SMALL BIRDS.

TO THE EDITOR OF THE TIMES.

SIR,—In a retired corner of the French department of the International Exhibition there lay a long row of mysterious and rather dingy specimens, which, in spite of their unattractive appearance, well deserved a study, even in the midst of the bright and beautiful objects by which they were surrounded.

They consisted of a very numerous collection of the stomachs of birds, with their contents spread out on sheets of paper, with a written description of their contents, the time of the year in which the bird was taken, and other particulars. They were the work of M. Florent-Prevost, the celebrated French naturalist, who for thirty years has been prosecuting his inquiries of this kind, and endeavouring to convince his countrymen of the suicidal folly of which they are guilty in the persistent and indiscriminate slaughter of these beautiful little creatures.

In taking steps to impress particularly upon our younger people in Australia the mistake they commit in destroying these birds which we are taking such trouble to introduce among them, I have put myself in communication with this kind-hearted and enlightened philosopher, and by his aid I have prepared a tolerably complete list of what is eaten during each month of the year by the more common of our birds. And, I think, that this list is worth study at home. When the destruction of small birds by poison and other means is attracting Parliamentary notice, and the undenied facts are brought before the public of whole tracts of forest land laid waste, and whole countries reduced to famine by the thoughtless removal of the only effective check upon the ravages of the insect tribe, we really ought to dwell upon that point. The little bird is our only safeguard against a pest, which but for it would soon become overwhelming. As Michelet very well says—"The bird can live without the man, but the man cannot live without the bird." Were we all to resolve ourselves into one great sparrow club, we should all in a few years perish from famine.

I trust, then, that this list will be found useful; and I would suggest to parents and teachers particularly that it might advantageously be cut out and preserved for future use, that the minds of young people might be properly impressed with ideas of the usefulness as well as beauty of the pretty little things that enliven our hedge-rows and hop across our paths.

Long-eared owl.—January, February, and March, mice; April, cockchafer; May, rats, squirrels, and cockchafers; June, meal worm, beetles, and shrew mice; July, mice, ground and other beetles; August, shrew and other mice; September, October, and November, mice.

Short-eared owl.—January, mice; February, harvest mice; March, mice; April, crickets and harvest mice; May, shrew mice and cockchafers; June, beetles; July, field mice and birds; August, field and shrew mice; September and October, field mice and beetles; November, common and field mice; December, mice, spiders, and wood lice.

Barn owl.—January and February, mice; March, April, May, and June, field mice; July and August, mice; September and October, field and shrew mice; November, mice and the black rat; December, mice.

Rook.—January, field mice and larvae or grub of cockchafer; February, field mice, grub of cockchafer, and red worms; March, grubs and chrysalids; April, slugs, worms, and chrysalids; May, beetles, grubs, prawns, and wire worms; June, cockchafers, eggs of birds, and wood-boring beetles; July, young birds, beetles, &c.; August, birds, field mice, weevils, crickets, and grasshoppers; September, grubs and worms; October, grasshoppers, ground beetles, and young animals; November, young rabbits and different insects and grubs; December, different animals and decaying substances.

Magpie.—January, grubs of cockchafers, young beetles, and corn and seeds; February, the same, and berries; March, the same; April, crickets, water rats, and mice; May, cockchafers, glow worms, and fruits; June, the same, and weevils; July, beetles and field mice; August, birds' eggs and weevils; September, beetles, worms, barley, and grasshoppers; October, grasshoppers, carrion beetles, and green locusts; November, grasshoppers and kernels of fruits; December, grubs of cockchafers, young rabbits, and berries.

Jay.—January, grubs of cockchafers, acorns, and berries; February, chrysalids, and different grains and seeds; March, grubs, insects, wheat, and barley; April, grubs of beetles, and snails; May, cockchafers and locusts; June, eggs of birds, cockchafers, and beetles; July, young birds, flies, and beetles; August, the same, acorns, grubs, and dragon flies; September, the same and fruits; October and November, beetles, slugs, snails, and grain; December, the same, haws, hips, &c.

Starling.—January, worms, grubs of cockchafers, and the dung of animals; February, grubs, snails, and slugs; March and April, grubs of cockchafers and snails; May, the same, and grasshoppers, and fruits; June, flies, and grubs of various flies, and fruits; July, grubs, fresh-water shell fish, and fruits; August, flies, glow worms, and various beetles, and fruits; September, green locusts, grubs of caries, beetles, and worms; October, worms and beetles; November, snails, slugs, and grubs; December, hips, haws, and buds of trees.

Golden Oriole.—January, various chrysalids. February, chrysalids, and worms. March, grubs and beetles. April, ground beetles and weevils. May, beetles, moths, butterflies, and grubs. June, grubs, grasshoppers, bees, and cherries. July, cherries and beetles. August, weevils, chrysalids, fruits, and worms. September, beetles, grubs, worms, and fruit. October, grubs, herbs, chrysalids, berries, and barley; November, ants and worms.

Crested Hoopoe.—January, worms, grubs, and snails; February, March, and April, the same, and birds; May, first dragon flies, and grub of Mayfly; June, water and land snails, flies, &c.; July, August, and September, the same, and wood lice; October and November, snails, flies, and spiders; December the same, and worms.

Green Woodpecker.—January, ants; February, worms and grubs of ants; March, slugs, beetles, and grubs of ants; April, ants and worms; May, red ants and grubs of wasps; June, bees and ants; July, red ants; August, red ants and worms; September, ants and worms; October, grubs of ants; November, grubs of ants and bees; and December, ants.

Reed Thrush.—March, grubs and insects; April, aquatic grubs; May, grubs of house and dragon flies; June, worms, grubs, flies, and May flies; July, beetles, and dragon flies; August, worms, eggs of insects, and beetles; and September, aquatic insects.

Great Titmouse.—January, beetles and eggs of insects; February, grubs; March, winter snails, beetles, and grubs; April, cockchafers, beetles, and bees; June, cockchafers, flies, and other insects; July, the same; August, insects and fruits; September, seeds, grasshoppers, and crickets; October, berries, and November, seeds.

Blackbird.—January and February, seeds, spiders, and chrysalids; March, worms, grubs, and buds of trees; April, insects, worms, and grubs; May, the same and cockchafers; June, the same and fruit; July, August, September, all sorts of worms and fruit; October, grubs of butterflies and worms; November and December, seeds and chrysalids.

Stylark.—January, seeds of wild plants; February, seeds and corn; March, various insects, worms, seeds, and corn; April, insects, beetles, and corn; May, flies and various insects; June, grasshoppers, worms, and corn; July, crickets and grasshoppers; August, insects, corn, and seeds of weeds; September, seeds, worms, and barley; October, November, seeds, corn, and berries; December, seeds of wild plants.

Redbreast.—January, insects, worms, and chrysalids; February, insects, worms, and wood-lice; March, chrysalids and worms; April, moth, eggs of insects, and cockchafer; May, grubs and beetles; June, flies, moths, spiders, and worms; July, moths, butterflies, and wood lice; August and September, the same and worms; October, eggs of insects and aquatic insects; November, worms and chrysalids; December, chrysalids, grubs, and eggs of moth.

Nightingale.—February, grubs, and worms; March, the same and chrysalids, and ground beetles; April, flies, meal-worms, beetles, and red worms; May, butterflies, cockchafers, weevils, and grubs; June, spiders, wood-boring beetles, and worms; July, worms, grubs, eggs of locusts, grasshoppers, moths, and flies; August, locusts, glow-worms, weevils, and grubs; September, locusts, beetles, worms, and dragon flies; October, grubs, worms, and beetles; November, flies and worms.

Linnet.—January, February, March, and April, seeds and berries; May, June, July, August, and September, the same and insects; October, November, and December, berries, seeds, buds of trees, and fruit.

Chaffinch.—January, seeds, berries, and kernels of fruit; February, the same and corn; March, the same and insects; April, moths, flies, and insects of various kinds; May, cockchafers, grubs, and eggs of insects; June, the same and wild fruit; July, the same and grubs of beetles; August, moths and butterflies; September, eggs of insects, worms, and seeds; October, wood-boring beetles and insects; November, seeds; December, seeds and buds.

Greenfinch.—January, February, and March, seeds, berries, wild fruit, worms, &c.; April, May, June, July, and August, the same and insects; September, October, November, and December, seeds, berries, worms, wild fruit, &c.

The sparrow only lives near the habitations of man. It varies its food according to circumstances. In a wood it lives on insects and seeds; in a village it feeds on seeds, grain, and larvae of butterflies, &c.; in a city it lives on all kinds of debris. But it prefers cockchafers and some other insects to all other food.

In looking over this list critically, our sparrow-killers will probably think that M. Florent-Prevost has here and there allowed the advocate rather to interfere with the philosopher, and they may miss some articles of food which it is notorious that birds consume. And in his zeal to show the amazing quantity of insects destroyed by his little *protégés* the proportion of fruit, grain, &c., also consumed perhaps scarcely accords with our less accurate observation. Still these results are obtained by actual inspection, and we may be sure that everything enumerated has been found. And we must remember that these experiments were made in France, and that the food of birds will always be largely influenced by local peculiarities.

It is worth mentioning that a study of M. Florent-Prevost's specimens showed another important fact ranging beyond the above list; that many birds, namely, living a good deal upon grain, feed their young entirely on insects, so that they are serving us admirably in this way at a season when insects are most rife, even when the examination of their own stomachs would lead us to denounce them as little better than mere plunderers.

And here I would draw attention to the value of another set of experiments recently reported in the papers, as suggestive of the incredible quantity of insects destroyed by such agencies. A gentleman took some young robins and fed them himself, weighing them and their food accurately day by day, to discover what quantity a young bird required to keep it in a growing and healthy condition. As he went on he became more and more astounded at the result, and he found that taking the common earthworm, as a representative of the food, the daily supply required to keep a young robin in its highest health, laid end to end, would reach the almost incredible length of 14 feet. This seems amazing, but those will not

hesitate to believe it who have watched the incessant activity during the long hours of a summer's day of a pair of birds with a nest of young. But let us put this and that together when we wish properly to estimate the services of this invaluable little thief-catcher, and with a true conception of the part he has to play among us, let us do what we can to save him from the wanton shot and cowardly poison.

I am, Sir, your obedient servant,
Reform Club.

EDWARD WILSON.

AGRICULTURAL LEGISLATION.

POISONED GRAIN, &c., PROHIBITION ACT.

An Act to prohibit the Sale or use of Poisoned Grain or Seed.—
[28th July, 1863.]

Whereas it is expedient to prohibit the sale and use of poisoned grain or seed: Be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. *Short title of Act.*—This Act may be cited for all purposes as "The Poisoned Grain Prohibition Act, 1863."

2. *Penalty for selling poisoned grain, seed, or meal.*—Every person who shall offer or expose for sale or sell any grain, seed, or meal which has been so steeped or dipped in poison, or with which any poison or any ingredient or preparation has been so mixed as thereby to render the same poisonous, and calculated to destroy life, shall in either case for every such offence, upon summary conviction, as hereinafter provided, forfeit any sum not exceeding ten pounds.

3. *Penalty for sowing, &c., poisoned grain, seed, or meal.*—Every person who shall knowingly and willingly sow, cast, set, lay, put, or place, or cause to be sown, cast, set, laid, put, or placed into, in, or upon any ground or other exposed place or situation, any such grain, seed, or meal which has been so steeped or dipped in poison, or any ingredient or preparation which has been so mixed as thereby to render such grain, seed, or meal poisonous, and calculated to destroy life, shall, upon a summary conviction thereof, as hereinafter provided, forfeit any sum not exceeding ten pounds.

4. *Solutions or infusions, &c., allowed for use in agriculture.*—Nothing in this Act shall prohibit the offering or exposing for sale or selling, or the use of any solution or infusion, or any material or ingredient for dressing, protecting, or preparing any grain or seed for *bona fide* use in agriculture only, or the sowing of such last-mentioned grain or seed so prepared.

5. *Recovery of penalties.*—Application of 11 & 12 Vict. c. 43, and 14 & 15 Vict. c. 93, to this Act.—*Informers (not a constable) entitled to moiety of penalty.*—*Indemnity to witnesses, &c.*—All penalties imposed by this Act may be recovered in England and Ireland before two justices of the peace, and in Scotland before two justices of the peace or the sheriff; and for that purpose in England and Scotland the provisions of the Act of the eleventh and twelfth years of her present Majesty, chapter forty-three, and in Ireland the "Petty Session (Ireland) Act, 1851," shall extend and apply to this Act, and to all proceedings in relation thereto; and it shall not in any such proceedings be necessary to allege or prove the ground or other place where an offence is committed to be the property of or occupied by any person: Provided always, that the convicting justices or sheriff may, if they or he shall think fit, award to the informer or prosecutor (not being a police-constable or peace officer) in any such proceedings any portion not exceeding one moiety of any penalty recovered under the aforesaid enactments: Provided also, that every informer or prosecutor, and every person who shall give evidence against any other person proceeded against under this Act, shall be freed and discharged from any such penalty which he may have incurred for or by reason of his having participated or aided in the commission of the offence with respect to which he shall so inform or prosecute or give evidence, provided the information against such other person has been laid, or such evidence has been given, before the laying of any information (if any) against such informer, prosecutor, or witness for the recovery of any penalty he may have so incurred.

THE HARVEST IN FRANCE.

DURING JULY AND AUGUST.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

Numerous and interesting details have reached us from our correspondents throughout France upon the state of the crops.

M. VANDERCOLE writes from Rexpoede, near Dunkerque (Nord), Aug. 14th: "Wheat and oats have been housed some days. During the whole of harvest we have had but twelve hours' rain. As to the quality of the grain, nothing can be finer. We estimate that white wheats will give, on an average, thirty hectolitres per hectare. Potatoes are magnificent, and there is merely a trace of the disease upon a few plots. In spite of the drought, the beetroots look well; and if from this time we have a little rain, they will give an unexceptionable crop. I can only repeat what I have already said—this will be a most productive year for us."

M. DEMESMAY writes from Templeuve (Nord), Aug. 11th: "Wheat is almost entirely harvested, and will furnish an abundant crop of first-rate quality, if we may judge from what has already been thrashed. We have already housed some oats, although much is still uncut; we expect both quantity and quality will be unexceptionable. Beans are fine, and if the weather be favourable when they are harvested there will, no doubt, be a produce such as we have not seen for a long time. Potatoes present a good appearance; scarcely any trace of the disease to be seen."

M. CAPPON writes from Merville (Nord), Aug. 9th: "The commencement of this month has been dry, which greatly hindered the development of many products of the earth, particularly the second cut of the natural and artificial meadows. The drought continued through nearly the whole of July, but a pleasant rain fell towards the end of the month, which benefited the tobacco and haricots. This rain was not sufficiently heavy for the potatoes; the early sorts have been attacked in their leaves by the disease, but the tubers still appear sound, though in general they are small. We can say yet nothing upon the scourge. If the fine weather we have had since the commencement of the harvest continues, our corn will be all gathered in in a week; part has already been housed under the most favourable circumstances—both quality and quantity are perfect. Oats yield an excellent produce. Tobacco and haricots, as well as potatoes, have suffered much from the drought; and if rain does not fall soon it is feared the tubers will be very small, and consequently produce little. The graziers complain that the grass has stopped growing for want of rain; however, the price of cattle keeps up, as well as that of horses. Of beans and hops we hope to have an average yield. Amongst the bovine race in our neighbourhood, there is raging an apthous disease, called *coats*; few, if any, have succumbed to this disorder, but it is a loss to the proprietors while the animals are ill."

M. PROVANT writes from Hendeourt-les-Cagnicourt (Pas-de-Calais), Aug. 8th: "The extreme dryness of July, together with the prevalence of north winds, gave us reason to hope that all our crops in general, and our wheat in particular, would ripen before coming to maturity. Happily these fears were not realised, for the ears only contain well-filled grains admirably formed. Beans are ripe, the poppies gathered, and oats partly thrashed. The produce of the latter is very varied; those sown in March are very abundant, while the crops sown later (in April) only yield a middling produce. The damage caused by the drought is chiefly to the second cut of clover, which will be little or nothing, and to the development of beetroots, though that may still recover its vigour if a good rain falls. Be that as it may, we hope for a continuance of the present weather, in order that we may be able to terminate the wheat harvest by the 14th or 15th of August. We cannot finish this letter without mentioning a considerable and almost certain loss for 1864—the failure of the young clovers in the cereals of 1863—a loss much to be regretted,

as, independently of its being good fodder, this leguminous produce leaves the soil which has held it in a more suitable state for the cultivation of flax. Our clay soil has become so hard that the plough can make no impression; we can scarcely scratch up our stubble with the aid of the extirpator."

Dr. ROTTEN writes from Clermont (Oise), 7th Aug.: "We are in the midst of harvest, and expect it will terminate in about eight days. The wheats are magnificent, and will yield abundantly. Even the little rain which fell in the latter part of the month forwarded the vegetation of haricots, and the second cut of natural and artificial pastures, which were at a standstill. The late oats have also profited by it."

M. BOURART writes from Charleville (Ardennes), Aug. 10th: "July has been dry and hot, in fact we have only had rain twice throughout the whole month—a thunderstorm on the 22nd, and a storm without thunder on the 20th; four times we have had a thick fog in the morning, and a light mist. The fine dry weather was, of course, very favourable for the harvest, which is most abundant, more so than has been known for many years. We are now gathering in oats; the early sown are very fine, but the late are not to be compared with them. The after-growth upon lands not irrigated have suffered much from want of rain. The second cut of natural and artificial pastures is, however, more abundant than we expected to see after the long drought. The odium has reappeared upon the vine stalks, which were invaded by this cryptogamia last year, and were not sulphured; it will also be necessary this year to apply sulphur several times if we wish to preserve our grapes. Potatoes are looking well at present; they are fine and good. We greatly hope that the disease, which has been on the decrease for several years, will soon disappear altogether."

M. TILLOY writes from Chapelle-Servon (Marne), Aug. 15: "Our wheats were all harvested by the 3rd of August in the best condition possible. The wheat from Saint-Land, Noë, and Wit-tran-Mill is even superior to the country wheats. We obtained in Noë wheat 60 hect. to the hectare of 80 kil. weight. Barleys come in rather thinly; we want a little rain for the oats. The wheat harvest is very good; oats and barley middling; hay, second cut, there is none. The potatoes are very small."

M. TASSIN writes from Clairvaux (Aube), Aug. 10th: "Every one seems satisfied with the appearance of the harvest, both as regards the crops already gathered in and those yet unhoused. This year, say the country people, there will be plenty for all—we hope both quantity and quality are good. The new wheat weighs nearly 80 kilog. the 100 litres. The dry heat which has prevailed the last ten days threatens to injure the growth of the grapes."

M. ABBE MULLER writes from Ichtratsheim (Lower Rhine), Aug. 9th: "Our barley and wheat harvest commenced almost simultaneously, about the 17th or 18th of July, and the wheat was all gathered in before the rain. If the custom of putting the sheaves in shocks on the field, which prevails in Lorraine, had not been given up here, no one would have housed the corn damp, and risked a certain depreciation of it thereby. We know that the corn thus exposed in sheaves upon the field, and suffered to ferment, gains both in weight and quality. Here we are too much taken up with the culture of the tobacco plant to pay much attention to the hay and wheat. The sheaves are very numerous, consequently they do not yield much; still the produce of corn is 6 hect. per hectare, and barley may reach 8 hect. per hectare. Throughout Alsace the Colza crop has been of the best; oil will not be wanting, as there will be an enormous quantity of nuts. It is the same in Lorraine."

M. ETIENNE writes from Saint-Sauveur-sur-Deube (Manche), Aug. 10th: "The harvest has been made with

great rigidity, as the beginning of the month was wet. Some cultivators used the moyette, though only a few. The wheats thrashed are magnificent, and promise an unexceptionable produce both in quality and quantity. The rain came opportunely for the buckwheat, roots, and apples. Haymaking is over, and the hay was got up in the best condition. The grasses and meadows have suffered for want of rain very much the last few days."

M. JEAN LEFÈVRE writes from Gevrolles, (Côte d'Or), Aug. 15: "The wheat harvest, which commenced in this part about the 16th of July, has finished well; excepting the first few days, the weather was very favourable. We are well satisfied, and do not remember ever having seen crops better in quantity of sheaves and grain, as well as quality. Oats, on the contrary, are very small, and yield much less than last year. In consequence of the intense heat we have had the last few days, grapes at the top of the vines have begun to dry up. Beetroot in general are not very fine this year; the drought was injurious for taking them up, and ours are devoured by the white worm, which destroy great quantities every day. We shall be glad to see rain soon, as the earth begins to be very dry, though we had a reasonable quantity last month. On the 29th a very extraordinary shower fell; the water attained the depth of nearly 34 millimetres in less than two hours and a-half."

M. MICHON writes from Champagne-sur-Viojeanne (Côte-d'Or), Aug. 10th: "The harvest was ended and housed fifteen days in advance of our ordinary year. We were mistaken in many of our prophecies. All over the Valley of Viojeanne the wheat and oat crops have been enormous; cultivators never remember there being so many sheaves yielding so much, and of such good quality. Two or three days' heavy rain at the commencement of July refreshed the earth, and increased the weight of wheat and oats, which is not general this year, the latter having suffered from the drought on the light lands. The maize has suffered a little; potatoes are generally fine, and are not affected by the disease. The second crop of lucerne has been good; our meadows, which we have watered, already offer a good aftergrowth; everywhere else on the Saône the meadows are brown and burnt up. To sum up, the granaries are full of fodder, and the fields of corn-sheaves. All is ready for the thrashing; straw will be very abundant, and consequently manure will be plentiful next year."

M. LAMBERARD writes from Vesoul (Haute-Saône), Aug. 9: "Our wheat and oat harvest is finished, but at what cost? Often the oats wanted the sickle as soon as the wheat, and as the scythe is scarcely known here, men and women using the sickle exacted fabulous prices, ruinous to the farmers. One of them assured me he had been asked 400 francs for cutting down his crops, which were fully ripe; not being able to incur this expense, he was compelled to use the scythe, with the help of his two sons and a neighbour. His crops suffered from the delay, but his harvest only cost him 50 francs. We hope soon to see better instruments for reaping in the hands of our poor cultivators, as they have already machines for thrashing. The farms being very small, several villages have taken for common use the clodcrushing-roller, powerful harrows, simple hoes, and, in fact, all instruments which can without danger be placed in the hands of the first comer. These instruments already render the cultivators more independent, and they must be obtained at any price. Cultivators have enough to suffer from atmospheric influences. What will become of them without the aid of these implements? Rain is looked for every day with great impatience."

M. BATAILLARD writes from Audeux (Doubs), Aug. 14: "Our harvest is quite finished; from the return of the corn already thrashed we may estimate the harvest of 1863 as superior to that of an average year in the following proportions: Wheat, 18 per cent.; rye, 25 per cent.; barley, 11 per cent.; oats, 30 per cent. In spite of this abundance, prices are still proportionately high. The drought has done much injury to the maize and potatoes, but there are no signs of disease in the latter. During the last ten days some poor after-growth of grass has been cut in the plains between Doubs and Ognon. Their scarcity will no doubt increase the price of native hay, which was rather low in our parts (29 to 31 f. for 500 kilos.)"

M. DUBOIS writes from Château-Thierry (Aisne), Aug. 12: "Thanks to an exceptional temperature, we have gathered in

the corn under favourable circumstances; there is both a good yield and a fine quality. The continuance of the drought has been very injurious to oats, so that the crop will be far inferior to that of last year. The second cutting of lucerne has suffered from the continued heat; it will yield a very insufficient crop. The white worm has made considerable ravages upon several plants, particularly beets and potatoes. The stubble pasturage has been of no use this year, so that the proprietors of flocks experience great difficulty in feeding sheep. We are anxiously looking for a few days' rains to bring forward the after-grass so much needed for cattle fodder."

M. COUTIL writes from Villiers-sur-Andelys (Eure), Aug. 12: "During the last month the weather has been very propitious for getting in the grain. The corn crop is good, it has yielded 20 quintals per hectare at the price of 39 to 41 francs, the quality being superior; it is an exceptional year. The seedlings, favoured by an abundant rain which fell on July 23rd, came up well, but since that the weather has been too dry. The growth of corn will be considerable in our parts. The wheat harvest is very forward, and we may hope to finish it by the 15th or 20th at latest. The straw is of excellent quality, the grain abundant and heavy, the number of sheaves greater than could have been hoped. The spring sowings have suffered most from the continued drought. The oat produce will be very ordinary: in many places the plant pulls up under the sickle, owing to the root having been cut by the white worm, which has done much damage to this crop. The second cutting of lucerne is passable: the clover has been given to the flocks, which could not live in the parched corn fields. The dry weather has destroyed many new artificial pastures sown with wheat and oats."

M. BOUTRAIS writes from Vendôme (Loir-et-Cher), Aug. 7: "The crops have been gathered in with splendid weather, and are above average."

M. FELIX DORN writes from Rocheux, near Mondoubleau (Loir-et-Cher), Aug. 13:—"Our wheat harvest has been finished for ten days; barley is also over in most places: both have been made in the best condition; some wheat was wet at the beginning, but there seems to have been no appreciable damage. Some farms already want water: a few weeks more, and there will be a scarcity of water as great as there was five years ago. The wheat crops have yielded well; barley will be moderate, and oats bad. There will be no second cut of fodder, the grass being burnt up. The cattle are declining in condition daily, and every one is puzzled how to feed them. It is too soon for the dry fodder, and the green is destroyed."

M. MIGNIOT writes from Bourbon-l'Archambault (Allier), Aug. 14:—"The harvest was finished a week or two ago; the result as to wheat, according to our predictions, is excellent both in point of quantity and quality. The steam thrashing machine, very much used in the centre of France, has been applied here also, every one being in haste to conclude their bargains before any depreciation in price, which the abundance renders probable, could take place. The millers have already tried the new wheat, and it is stated to yield in flour from 15 to 20 per cent. more than that obtained from last year's corn. Oats remain about the same: there are fewer sheaves in the fields than last year."

M. BIAUD writes from La Filandière, near Châteauneuf (Eure-et-Loir), Aug. 11:—"A month has passed without a drop of rain, which enabled us to gather in the corn in the best condition. Our oats, which are generally forward, have been reaped some time; we were determined to get them in before rain. We may consider the present harvest of wheat, barley, and oats as one of the best we have had for many years. The grain is full and plump, but I do not yet know what the return will be, as the harvest work has prevented our commencing thrashing yet. The meadows, natural and artificial, are literally roasted. No species of after-growth can be reckoned upon, which will be an enormous loss in these parts, as numerous flocks must be fed during the winter in the sheepfold."

M. JULES GY writes from Kerdurant, near Port-Louis (Morbihan), Aug. 12:—"All the crops are cut and tied up. Rye, which is now being thrashed, is very good. We have a harvest exceptionally good, both in straw and grain. Millet and buck-wheat are as fine as possible. Potatoes are so far sound and very good. With regard to the drought, beet root

and cabbage fodder are pretty fair, but the haricot beans and other leguminous plants suffer much."

M. CHARLOT writes from Nezelles, near Amboise (Indre-et-Loire), Aug. 12:—"The important work of harvest is almost finished in most parts of our department; some oats and barley only remain to be gathered in. The high temperature is favourable to the dilatory and lazy. The scythe, the bagging-hook, and reaping-hook have for some years played an important part, and fought their way against the sickle; we hope to see this latter implement dethroned in the greater operations, but it will maintain its hold for a long while in smaller ones. In some localities the beating down of the corn and intense heat have hindered the grain from filling out, which will cause a deficiency. There is a sensible difference in the quality of the grain towards the southern part, to the south of the Loire, and that of the north; in the latter the grain has been less attacked and less injured. There will be much difference in the quality of the grain. We remark with pleasure that our cultivators who make a long stubble hasten to collect it and put it in heaps almost immediately after the earthing of the wheat; we have already half of it cut, by which means great advantage is gained in the quality of the stubble. This good example was obtained from the small culture. The terrible canicular heat and long drought we have undergone for more than a month, have done much harm to the growth of some plants, such as potatoes, haricots, beets, hemp, the poppies, which we have begun to cultivate round us as oleaginous plants, and also to the spring barley and oats; these two cereals are not good in poor land. Above all, the drought has been most prejudicial to the after-growth of natural and artificial pastures. It is to be hoped that the quality will compensate for the lack of quantity in all the products we have enumerated. Our country begins to suffer much from this long drought: many of our small streams, ponds, and even some wells are completely dried up. The colza and turnip seeds are cut and thrashed, the grain is fine and of the most satisfactory quality. All the hay is made; there is less in quantity than usual, but the quality is generally superior."

M. CAMILLE BOUDY writes from Grand-Jouan, near Noyay (Lower Loire), Aug. 13:—"In the space of nearly two months only 17 millimetres (scarcely $\frac{1}{2}$ inch) of water fell, while the heat reached to 30 and 33 degrees in the shade. To the light lands of this country accustomed to less drought these meteorological phenomena, continuing so long, have proved fatal to many of the crops uncut; the flowering of the buckwheat for instance, is greatly injured. To all fodder plants the damage is considerable, except cabbages, which seem able to wait patiently the return of the rain. The harvest, conducted in very fine weather, is over now, and the thrashing-machines are beginning to be heard in the country. As far as it is possible for us to judge at present, the wheat harvest, though it will not answer the expectations we had formed previous to the bad weather in the first fortnight of June, will, nevertheless, be infinitely superior to that of last year. The sheaves are abundant; the ears of corn not laid are well filled, and the grain plump. Perhaps we shall not be able to say as much for the spring cereals, after having been attacked so by the intense heat. M. Rieffel, however, has reason to be very well satisfied with the spring wheat, which is the first variety of that season, and which is so successful now in Grand-Jouan."

M. REBAUDINGO writes from Châtillon-sur-Loire (Loiret), July 31:—"Thank God we are still able to say this year that the crops are, and will be, very abundant and good. We have grass and every species of cereals in plenty."

M. JARRIN writes from Boureg (Ain), Aug. 3:—"The wheat harvest, made in admirable weather, and finished by the 5th of July, is above the average both in quantity and quality. In spite of the drought, we have been able to sow buck-wheat, and it has come up, but now wants rain badly."

M. GARIN writes from Nantua (Ain), Aug. 4:—"The month of July has been undoubtedly the finest month in the year, for with moderate heat we enjoyed magnificent sun for the first twenty days. The crops are quite equal to what they promised to be, the harvest has been magnificent, and the potato crop, next in importance to that of wheat, promises exceedingly well. The slight quantity of rain which

fell in the last days of the month, and which only reached 22 millimetres, rather damaged the after-growth of grain."

Dr. MASSOULARD writes from Saint-Léonard (Haute-Vienne), Aug. 15:—"The continued drought has much injured if not destroyed the autumn crops; buckwheat droops, and the roots do not grow; the springs fail, and the meadows are dried."

Dr. MENUDIER writes from Saintes (Charente-Inférieure), Aug. 7:—"The thrashing of corn will soon be finished; the return is good; the weight 81 kilos. the hectolitre, and straw abundant. Barley is not so satisfactory as wheat, the drought having seized it too early. Potatoes, maize, and root plants do not promise well; even if rain came now, it would be too late. The meadows are burnt up, and the cattle are eating maize; hay, which was very low, is rising in price, as there will be no second crop."

Dr. CHAPPELLE writes from Angoulême (Charente), Aug. 14:—"The cultivator is more and more deceived in his hopes; the prospect of a rich harvest vanishes before a continued drought and tropical heat; since the 29th of June last, there has been no heavy rain to moisten the soil at the root of the plants. Vegetation languishes everywhere, and the frail tissues are burnt up. Maize, haricots, potatoes, &c. are emaciated, and become sterile. In some light lands they have taken up the potatoes, but find them dried up, the tubers small, scarcely exceeding the size when sown. As to the corn, thrashing is proceeding generally; the grain is excellent, above the average weight, and the quantity rather more than ordinary."

M. CHAIGNEAU writes from Ruffec (Charente), Aug. 13:—"We have now nearly concluded our estimate of the harvest in Basses-Alpes, and may reckon it an average year. The grain is everywhere good in quality, though rather small; the straw less abundant than in 1862, but finer and consequently better for the cattle. The hay crops have been generally abundant, and it is many years since the mountains in the divisions of Barcelonnette have yielded such quantities, which is most fortunate in this country, where industry or labour is so little developed, and which derives its chief profit from cattle. The potatoes are nearly ripe; but those who have dug theirs up, are not content with the returns. The heat during the last three weeks has been very great; Réaumur's thermometer has often stood at 25 degs. in the shade indoors, and from 28 to 29 degs. under the trees."

M. DELATRE writes from Thym-Laurier, near Ciron (Vienne), Aug. 14:—"The heat continues with deplorable intensity: everything is dried up, and languishes in the fields or those gardens which cannot be watered. Peaches are smaller now than they were two months ago; root plants will give a very bad crop, and the late-sown potatoes seem ripe, if we may judge by the stalks, but the roots are so small, we shall scarcely have more than a quarter of our ordinary crop. The harvest has been finished in our part a fortnight; it has not lasted so long as might have been expected, from the difficulty in getting labourers; it was made in fifteen days. Thrashing has commenced, and the result is satisfactory upon the whole, though not quite up to the expectations of some; there is, however, plenty, as the lowering of the prices continues in the markets. Our fairs are affected by the drought; all cattle, with the exception of mules, sell badly."

M. DE BAIVE writes from Du Puy (Haute-Loire), Aug. 11:—"Thrashing has begun, but the result cannot be known precisely till the end of the month. However, from the weight of the sheaves, we may judge that all the grain crops will be good, both in quality and quantity. But on the other hand, all the smaller crops sown in spring, such as lentils, beans, peas, and even potatoes, have suffered greatly from the drought, which has overpowered us for the last three months: their product, which is very important to us, will be scarcely worth mentioning. It is the same with the autumn fodder crop: there is only half a harvest of clover and lucerne; beet-root, seedling maize, beans, and peas have but a languishing vegetation. Root crops have not come up; meadows which are not irrigated are burnt up, and will give no aftergrowth. Our cultivators, destitute of green fodder, are obliged to use the hay usually kept for winter. The springs and brooks are dried up, and many of the landholders are obliged to take their cattle a long distance to water them."

M. DE LANTILHAC writes from Lavallade (Dordogne), Aug. 7:—"The month which has just past has been unusually dry; the four days of rain, the 7th, 23rd, 28th, and 29th only

gave twenty-one millimetres of water. The vegetation of root-plants and second crop of artificial fodder were beginning to decline sensibly, when the storm of the 28th spread its refreshing water over the fields. Maize, beet-roots, and carrots have as yet suffered little. They have thrashed the corn throughout Perigord, and we remark with pleasure that the machines for this work have been sought by the farmers with an eagerness that promises well. General complaint has been made of the return, which will be in some places below average, a disappointment the more felt as the number of sheaves has been greater than usual."

M. BORDAS writes from Puisse, near St. Front d'Alemp. Dordogne, Aug. 14th: "During the last two months we have had but two or three days' rain, and then so slight in quantity that it scarcely penetrated 3 or 4 centimetres. Under these circumstances we have not been able to sow maize and roots, which will consequently deprive us of a very valuable resource. Thrashing is carried on with astonishing rapidity: some using the machine; others, having no other business, on account of the drought, making use of the flail. The fine appearance of the corn led us to hope for a good harvest; but the yield is poor. Weeded plants, except maize, suffer considerably from the extraordinary heat, and, even should rain come, the damage cannot be repaired. All the fodder plants suffer equally; and the aftergrowths of the natural meadows are nearly lost."

M. FAURE writes from Lesparre (Gironde), August 12th: "The extreme heat of July continues still. Complaints are everywhere made of the drought. Herbage is dried up, the cattle suffer, and the gardeners alone have any vegetables. There will be scarcely any maize or haricot beans. Thrashing is nearly finished, and people generally are satisfied with both quantity and quality of the corn."

M. PETIT-LAFITTE writes from Bordeaux (Gironde), Aug. 10th: "The corn, ripened rather prematurely by the heat, was all cut by the 1st. A larger return might have been expected, but farmers are satisfied. The other crops, such as maize, potatoes, haricot beans, &c., have almost stopped growing. The natural meadows are dry and yellow. Beet root wants rain. We have had some hail, and expect rain."

M. DE GALBERT writes from La Buisson (Isère), August 9th: "The state of agriculture for July is as follows: Tropical heat slightly tempered towards evening, with a northern breeze: not a drop of water: all the autumn crops are suffering from the drought. There will be no aftergrowth, and a death of maize as well as other green fodder crops."

M. PAGANON writes from Grenoble (Isère), Aug. 1st:—"The corn crops are out in the plain; the quality and quantity of the grain are good."

M. DE MONEIGNAT writes from Rodes (Aveyron), Aug. 4th: "Thrashing is now going on. The estimates are contradictory—here a good harvest; there the corn is shrivelled and will weigh little. Rye yields little. The spring oats everywhere have been spoiled by the heat; but the winter oats are better. On the whole, the grain crops are pretty good, sufficiently so to keep down prices. Reapers have been paid as much as 5 fr. (4s. 2d.) per day—a powerful inducement for the introduction of the reaping machine. Potatoes are spoiling: mine have been attacked by the disease for the first time. The weeded plants have suffered much from the drought. Carrots, beet, and roots in general have come up badly. Cattle keep up a high price. It will be a good year if the price of corn keeps rising."

M. LAUPERS writes from Rousset (Gard), Aug. 18th: "We suffer greatly from the drought. The return in corn is less than we hoped, and is below the average. Potatoes and leguminous plants produce little, on account of the drought."

M. PAUL DE GASPARIN writes from Orange (Vaucluse), Aug. 1st. "The corn crops are all gathered in, and we can give the exact results. The crop of wheat an average. That of oats has failed: the little they have gathered in is bad."

M. DUPREYAT writes from Beyrie (Landes), Aug. 5th: "The harvest began with oats on the 30th of June; wheat followed immediately, and it was all over by the 15th of July. Thrashing is now going on with the machine: the yield appears very ordinary."

M. GROS, JUN., writes from Régusse (Var), Aug. 10:

"Our corn crops are now for the most part thrashed and stored; the returns are small, and the harvest, on the whole, a third below average. Our lands are dried up, and the want of rain is greatly felt, for since the middle of June we have had none, and this during 40 or 50 days of tropical heat, without any sign that it will cease."

M. DE MOLY writes from Toulouse (Haute Garonne), Aug. 9: "During the month of July, the heat has been continuous, but not excessive. Unfortunately the rains have been rare and insufficient; there has been a general drought since the beginning of August; and at this time we fear that the summer crops, particularly maize, will not be so good as we hoped a month ago. The most unfortunate circumstance is, that the harvest is more or less below the average, not only in the department of Haute-Garonne, but in nearly all the South-west of France. There is a general deficiency in the yield of the sheaves as well as the ears, which are not filled."

M. DE LAVAU, Sainte-Fortunade, writes from Tulle (Corrèze), Aug. 9: "Now that the accounts of the harvest are completed in the department of Corrèze, we can form a better estimate. At first the probable deficit was exaggerated: although there has only been sufficient thrashed for present need, we can judge that the deficiency in weight of corn will be compensated by the quantity of straw. The yield will not be less than last year, and will equal that of an average crop. Oats are cut, and the quality is good. A burning sun, with the absence of rain for more than a month, has so hardened the earth as to render even surface labour impossible. The meadows are parched; the cattle can find no nourishment there, and have to be fed in the stable. There is no aftergrowth except in watered meadows. Buckwheat suffers greatly, but a little rain would revive it."

M. Count BOSSI FEDERIGOTTI writes from Roveredo (Trentin), Aug. 11: "I may give a very good account of all that is going on in our fields. If some crops are a little inferior, it is not from defective growth, but from the storms which have occurred."

M. KAINDLER writes from Relisane (Algérie), Aug. 6: "We are in the midst of thrashing, and the results justify the hopes of the colonists. The price of corn is moderate; wheat is worth 11 francs the quintal, and barley 8 fr. 50 c. The intense heat of July (the average in-doors having been 34 deg.) combined with the abundant and regular irrigation, have given great vigour to the cotton plant, which presents a fine appearance; the pods are numerous and already large; there is no trace of insects on the leaves. In spite of the abundance of the winter rains, some planters have succeeded, thanks to the nature of their soil, in preserving the last year's cotton plants: these two-year-old plants are heavily laden with pods. Although in Algeria we ought not to reckon the crop till it is in the bags, we hope that of cotton will be abundant. If there should not be a depreciation in price—the secret of which, the war of the North against the South alone holds—the planters of Relisane will have a good remunerative crop."

In conclusion, the corn harvest, which is now everywhere finished, is excellent in the North and centre; in the South and South-east it is generally pretty good, but the return is less than had been hoped. Some of our correspondents speak of a deficit. The root crops suffer much from the drought, of which our correspondents complain universally; however, so far, this drought has only caused partial failures, more especially in the second crop of fodder. If rain comes soon, as we hope it will, it may, in spite of the season being so far advanced, produce good results to the crops still standing.

ROYAL BUTTERFLY.—On Wednesday, Sept. 9, this celebrated bull won the Cup, with £25 added, at the Wigton meeting, Cumberland, beating a field of 25, open to all England, including the Duke of Tyne, winner of the first prize at Worcester. On Thursday, at Cheshire, he was equally successful, carrying off five first-class prizes.

THE SOCIETY OF GERMAN LANDOWNERS. TWENTY-FOURTH ANNUAL MEETING AT KONIGSBERG, IN PRUSSIA.

Before giving a description of the above meeting, it may not be uninteresting just to say, in passing, that Königsberg is situated on the Baltic coast, and is distant some fourteen hours' ride by rail from Berlin, and about the same distance from Königsberg to Warsaw, and distant from England not far short of a thousand miles. Königsberg, as many of your readers are perhaps aware, is a very ancient city, its cathedral being built in the year 1332; it was formerly, too, the capital of Prussia-Propria, and even now the Prussian kings come here to be crowned (and as the Prussian people add, by way of satire on the present king), "by the grace of God." An immense trade is done in corn, tallow, butter, and flax; this city is also renowned for the quantity of amber collected on the sea coast. The streets are very narrow and anything but level, and the shops badly built and arranged, and on the fronts of some may be seen two sign-boards, one in German and the other in Hebrew, giving a description of the wares for sale inside; an immense number of Jews residing here, accounts for the Hebrew, many of whom, one would think, cannot speak the German language. It is far from being a clean city, and the stench that meets one's nose at every turn is abominable, for the sewage from every house runs down the streets in open drains, and if a second "Mehi" should spring up in the neighbourhood, there is a fortune for him. At present it is "a sin and a shame;" for the land along the line is poor in the extreme, and very badly cultivated.

The show ground was situated just outside the city, on a flat piece of ground used for exercising the soldiers, which numbers in this city some 12,000, and to a stranger one cannot imagine why such an army is kept up. In Prussia, at every turn and every railway station soldiers and officers in uniform meet your eye. No wonder at the people complaining; as to liberty there is little. Your correspondent, who took private lodgings during the show, was requested by the landlord before he could inhabit them to report himself to the police authorities, "and say" he was a stranger, and intended to lodge at Mr. —. This is the law at present in Prussia, but it was unheeded by your humble servant, who replied: "If the police want me, they must come to me: I must positively decline to go to them," adding, "I have my passport;" but before I could inhabit them, the landlord was obliged to go himself and report, or he would have been subject to a heavy fine.

But to proceed with the description of the show: The implement yard was, from some cause, separated from the yard where the horses and cattle were exhibited. This was detrimental to those who had come a long distance to exhibit their implements; for the consequence was, the first days on which the horses and cattle were to be seen by the public, the implement yard was entirely deserted, and it was a farce for the exhibitors to be on their stands, and if there is no valid reason (and I confess I saw none) why they should not be in one enclosure, it would be well if the committee remedied this defect for the future, and took a lesson from our agricultural meetings in England; the arrangements in all other respects were good, and to contrast them with the Hamburg exhibition, one cannot help saying they were first-rate, for at Hamburg every possible obstacle was thrown in the way of exhibitors: an enormous charge was also made for shedding; and without any notice, exhibitors and their assistants, when they pre-

sented themselves at the entrance-gates, were mulcted of the sum of 18s. each before they could enter, to say nothing of the most extravagant charges demanded for sheaves of corn and other articles required by exhibitors, who sent machinery and their assistants hundreds of miles, and necessarily at a great cost. At Königsberg it was just the reverse: shedding free, exhibitors and their servants free admission, and only a nominal charge made for articles required by exhibitors for showing their different machines at work; in fact, civility and courtesy, from the president, judges, and secretary downwards, was the order of the day: all seemed determined to please the exhibitors, and unite with them in making the exhibition a successful one. And successful it was; for the majority of the exhibitors in the implement yard appeared satisfied, and the public too; for up to the last hour on the closing day (August 29), many seemed loath to leave the machinery yard.

The judges at the commencement set about their work in earnest, and, as far as time and circumstances would permit, tested the various machines brought before them, before a medal or prize was awarded.

The only English exhibitors of implements were Garrett and Sons; Boby, Bury St. Edmunds; Nicholson, Newark; Aveling and Porter, Rochester; and Bentall, who exhibited through his Hamburg agent.

Engines and thrashing-machines were first tried: Garrett's representative was the last to come up to the scratch with his machines, and when fairly got in working order he astonished his competitors and the judges by thrashing the same quantity in considerably less time, and the work done was, to use the judges' words, "first-rate," and so it appears in the report which was published soon after the show opened to the public.

Haymaking-machines were next tried, and the contest lay between Nicholson's and Boby's. Straw and rubbish were strewn all about the show ground, for the different machines to turn over, and after three or four trials the large silver medal was awarded to Boby's double-action haymaker, the report says "for its extreme simplicity and efficiency."

Corn-screening and dressing machines were next tried, and the silver medal in this instance was also awarded to Boby, also a bronze medal for horse-rake and bronze medal for lawn-mowing machine.

Nicholson's oilcake-breaker was much admired, and received the silver medal. His haymaking-machine and rake was awarded a bronze medal.

Aveling and Porter, of Rochester, exhibited one of their traction-engines, which ran about the show-yard and twisted and turned itself about, and created an immense amount of interest; but some of the ladies complained of its going about, and being allowed to belch forth steam and soot on to their white bonnets and shawls. Be that as it may, two were sold; and the one exhibited was awarded the silver medal.

Bentall exhibited through his Hamburg agent, and did not fare so well as regards prizes as his brother-exhibitors—for a reason, as related by the agent himself. The machines were sent from Heybridge to the care of Messrs. Williams and Giel, shipping-agents, of Fenchurch-street, London, for shipment from Hull to Königsberg: the carriage was paid to Hull, and from Hull to Königsberg the carriage and expenses were to be charged forward. On the arrival of Bentall's agent at Königsberg,

the carriage of goods, he says, were charged at a very high rate, and the person who received the goods at Königsberg from Williams and Giels had orders from them not to let the goods go on the show-ground until he had received the money. The consequence was, "a diapete," and much valuable time was lost; and by the time the machines were fixed and ready, the judges had nearly done their work. This explanation is necessary, as some might fancy that some foreign manufacturer had beaten Mr. Bentall, as he received only a bronze medal, and yet exhibited some twenty-five machines. German farmers set some value on the prize system, judging from the machines purchased; and it is a pity that any exhibitor should suffer through such mishaps as have been described. But exhibitors would do well to look to this, in sending goods for foreign exhibitions. It can surely be remedied before the goods are sent off.

The duty in the Zollverein on agricultural machinery is very heavy; where wrought-iron is employed the duty is 18s. per cwt. Notwithstanding this, and the expensive labour employed in England, some of the best and most expensive machines found purchasers. One would have thought with such a duty we should see something original; but, on the contrary, copying from English machines seemed to be the fashion, and encouraged too by the Society, who are ready to award premiums for good copies. A Mr. Eckert, of Berlin, exhibited copies of Coleman's cultivator, the Union Foundry Company at Königsberg exhibited copies of Burgess and Key's mower, Bentall's pulper, Coleman's potato digger, and another firm at Berlin had an exact copy of Garrett's thrashing-machine. To remedy this, the best way is to advertise in some of the German papers, and warn the public against purchasing such things, as, judging from the workmanship, it must bring the original inventor into disrepute.

THE CATTLE.

The horses were first thrown open to the public; and a splendid show it was, principally carriage horses, some few thorough-breeds, and cobs. It would serve but little to give the names of the successful exhibitors, whose names were called out by the President of the Society, and who sat on a dais, surrounded by the committee and judges.

An immense stage was constructed of wood, and formed

a square; each seat was raised above the other; in fact it was similar to a circus, only it was a square. About 12,000 people were accommodated, half of which were composed of the fair sex, all dressed out in "full" dress. The successful horses were led round inside by a groom dressed up as a jockey, and if the horses exhibited any plunging, kicking, and neighing qualities, he was encored, and led round a second time amidst the plaudits, bravos, and waving of handkerchiefs of the spectators. A charge, of course, was made to see this exhibition of the prize horses, the performance of which lasted three or four hours; and in this respect, too, every thing seemed to be well managed.

That part of the yard in which the bulls, cows, heifers, sheep, and pigs were exhibited was not thrown open to the public until the two last days of the show; but a Mr. Christopher Keck, of Danzig, exhibited pure English breeds in all these classes, and took all the first prizes in their particular class. The pigs he exhibited were first-rate; and over the pen was a placard, stating that they were warranted to be Suffolk breed, and from Mr. Thomas Crisp, of Butley Abbey. This same exhibitor showed some thorough-bred Leicesters and Southdowns, also some Shorthorns and Ayrshires, which in every case made the occupants of the next pens appear deformed, and wanting in every thing. No English exhibitor exhibited at all in the cattle department.

The Merino Sheep were extraordinary, and were much admired by every one, and all the best kinds found ready purchasers.

The medals were awarded to the successful exhibitors of implements the day before the closing day. A dais was erected for the President of the Society and the Judges, and as the names were called out by the President, each exhibitor or his representative stepped forward, and walked up to the dais to receive his medals from the hands of the President direct.

At the close of the proceedings the English exhibitors stepped to the front of the dais, and called for three British cheers, which were given so heartily, that the President and the spectators for the moment appeared at a loss to know whether they were on their head or their heels; but it gratified the President and committee much—at least so they expressed themselves both in public and in private; and so ended their meeting at Königsberg.

THE AGRICULTURIST'S WEATHER GUIDE.*

Anything at all sensible as a cheap popular book, to turn the empirical and very generally absurd notions of weather prognostics into something like practical opinions of what is likely to happen from definite meteorological condition, has long been wanted amongst the mass at large; and of all classes next to sailors, none so need accurate and reliable principles of weather-wisdom as farmers. To the sailor the forecasting of the weather tends to the preservation of life and of the property placed in his charge. The agriculturist produces a nation's food. A good harvest is highly profitable to them—beneficial to their country; a bad harvest, loss and destitution amongst a people. A long study of meteorological conditions over long periods of years might be even advantageous in giving farmer knowledge to the tiller of the land, as to when to sow and when to reap; while the minor variable changes, which take place from day to day and week to week, exert such direct and immediate effects upon the crops he grows, and the state in which he can harvest them, that it is no wonder the farmer anxiously seizes on any assertion, or saw,

grounded or baseless, that may be presented to him. Modern farmers are, however, far more sensible than their ancestors; and, as scientific knowledge has been found highly profitable in the actual culture of the soil, so they are well inclined to believe that a proper knowledge of the science of weather may be equally beneficial.

No reliable book has, however, hitherto been put before him. Admiral Fitzroy's "Weather Book," excellent as it is, and much more voluminous than the little pamphlet-like work before us, was not designed for the instruction of the farmer in particular, but to convey the principles and details of the science of forecasting and of meteorological science generally; whereas the chief objects of Mr. Criswick (formerly assistant meteorologist at the Greenwich Observatory) has been to substitute scientific grounds on which farmers and others may build their anticipations of the weather, in place of the empirical predictions they have hitherto relied upon. For this purpose, both the ordinary signs, as gathered from nature without the aid of philosophical instruments, and those afforded from the phenomena of the thermometer and anemometer, are enumerated, as well as their causes fully explained.

The first part is taken up with weather prognostics from

* "The Agriculturist's Weather Guide and Manual of Meteorology." By Henry C. Criswick. London: Houlston and Wright. 1863.

natural phenomena without instrumental aid. The second part is devoted to a description of the principal meteorological instruments, with wood-cut illustrations, in which the reader is informed concerning the principles on which the action of each instrument depends, and its proper use and management, including a chapter on instrumental errors and the methods of correction, prices of instruments, &c., concluding with a chapter on the phenomena of the barometer, and the inferences to be drawn from them. This is followed by an inquiry into the average direction of the wind with regard to the distribution of the various directions over the different months of the year.

The third division contains a few of the principal tables used in reducing meteorological readings to mean daily results, for barometer and wet and dry bulb thermometers, and also for finding the dew-point temperature.

Following these tables are some exhibiting the mean daily temperatures, atmospheric pressure, and temperature of evaporation, rainfall, &c., for several places throughout the country. These tables also serve as tables of comparison, by which the indications of the instruments may be at any moment compared.

Following this is a note, with illustrative tables, on the temperature of the ground—a subject very little understood, but one of the greatest importance to agriculturists. The book concludes with an example of a daily record of observations.

Thus the purpose and aim of this unpretentious but excellent little book is to enable the farmer to make himself a practical meteorologist, and so give him a better basis on which to calculate the most suitable times for commencing or completing the various operations of his occupation. It is not a little singular that amongst the many handbooks on the various topics connected with the farm, none as yet have appeared on this important branch; and here, therefore, still ignorance and empirical pretensions have full scope, and dis-

play a very strange picture compared with the really advanced knowledge the farmer has attained to in the use of machinery and fertilising matters. Without doubt, a careful study of Mr. Criswick's handbook will put it in the power of any person of ordinary capacity to use meteorological instruments with facility and advantage, and will enable them to reap all the benefits that a thoroughly practical knowledge of the science is capable of bestowing.

We are pleased to see the author keeping in view the class for whom this book is written by stripping the language, as far as possible, of scientific technicalities. Every chapter has, nevertheless, been made as complete and comprehensive as possible, so that a person totally unacquainted with the subject would get up from a perusal of its pages with a very fair idea of the leading features of scientific weather-wisdom.

There is also added to the other matter notes on the effects of electricity and ozone upon vegetable life—a subject of much interest.

His many years' experience as an observer and practical meteorologist, as well as his intimate acquaintance with the theoretical progress of the science, have well fitted the author for the work he has undertaken; and we dwell on this point the stronger, that it is necessary, the class to whom it is addressed should have confidence in the author who engages to teach them. The book might possibly have been increased in size with advantage to the scientific reader; though, to the less-informed, and for general practical purposes, more matter than was absolutely needed to render the essay what it professes to be—the agriculturist's weather-guide—would have been rather an evil than any benefit.

The work is appropriately dedicated (by permission) to Sir F. W. Herchell—than whom no one can claim a higher right to the title of meteorologist, and than whose opinion none is more valuable, and whose patronage is a guarantee for the merits of Mr. Criswick's labours.—*The London Review*.

DEPOSITS OF GUANO UPON THE COASTS AND IN THE ISLANDS OF THE PACIFIC OCEAN.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

The deposits of guano (*guano de pejaró*) are spread over the coast of Peru, between the 2nd and 21st degrees of latitude south. I saw the first deposits in the bay of Payta, and advancing south found it here and there almost to the mouth of the Rio-Loa. Beyond these limits guano is again seen, sometimes even in great abundance, but then it is almost entirely deprived of ammoniacal salts and the organic principles which give to it its useful properties.

Advancing still further south towards the equator the principal *huaneras* are those of Chipana, Huanilloa, Punta de Lobos, Pabellon de Pica, Puerto Ingles, Islas Pabillos, Punta Grande, Isla de Ignique, Pisagua, Ilo Jesus-y-Cocotoa, the islands of the bay of Islay.

Between Islay and a place situated some leagues from Pisco, guano de pejaró (bird guano) is unknown, the waters being principally frequented by seals, porpoises, and sea wolves (lobos), so that the beds of guano found in these parts, besides being very limited, are almost entirely composed of the excrements and skeletons of these animals.

The guano is deposited over the small promontories, upon some cliffs, where it fills the cavities, it being there the birds generally find shelter from the strong south breezes. The rocks upon that part of the coast consist of granite, gneiss, syenite, and porphyritic syenite: the guano which they support is mostly in horizontal beds; sometimes, however, they are inclined, as at Chipana, where they become almost vertical. In certain *huaneras* we observe a mixture of the excrements of birds, fishes, and cetaceas (lobos). M. Francisco de Rivero particularly noticed this mixture at Punta de Lobos, where, on the strata of dark grey guano he found superposed other strata nearly black, two feet thick, covered in their turn by fresh birds of various colours. The black stratum is full of small porphyry stones, glistening and elliptical, such as seals

are in the habit of swallowing, which always accompany their defections.

The deposits of guano are usually covered by a conglomerate of sand and saline substances (*caliche*), which the workmen clear away before they commence operations. In some parts, such as Pabellon de Pica and Punta Grande, the bed is under a mass of sand descended from the neighbouring mountains, and nothing better establishes its antiquity in that locality than an observation made by M. F. de Rivero. Upon the rock which forms their base may be seen horizontal beds of guano, supporting a deposit apparently of ancient alluvium 20 feet thick, in which are found the impressions of marine shells, and on that alluvium, contrary to custom, are placed several strata of guano, again covered by sand of modern alluvium. Most frequently the working of guano takes place in the open air, after having laid bare the bed by raising the crust of *caliche*. But the *huanera* de chipana is excavated by subterranean works, opened under an arenaceous and saline conglomerate.

In the *huanera* de Punta de Lobos the guano de pejaró is in horizontal strata, slightly dipped, is very dark brown, and contains some guano de lobo, which enclose bones of porpoises, seals, and the polished elliptical stones which always characterise the defections of these animals. They break the mass with a pick-axe and reduce it to powder. The guano after being placed in sacks is conveyed on rafts (*balsas*), which again transfer it to small vessels (*guaneros*). The workmen receive a piastre (4 f. 50 c., or 8s. 9d. English) per day, their food, and good water, which they are obliged to fetch from Rio-Loa when the ships do not bring them any.

La *huanera* de Pabellon de Pica takes its name from the village of Pica, situate 30 leagues in the interior. It is a conical mountain 1,000 feet high. Next to that is a chrysal-

lime rock 500 feet high, covered by a very modern grit perfectly characterised. The thickness of the strata of the guano overlying the grit is from 15 to 30 varas.* The product most esteemed is brought from an escarpment 200 varas in breadth, which covers a mass of sand. In the lower zone the strata are separated by an ancient alluvium from 2 to 3 varas thick, and excessively hard. Sixty workmen are employed where the road is sufficiently deep to admit of the vessels casting anchor 25 varas from the wharf.

To the north of Iquique are the three isles of Chincha, the most rich in ammoniacal guanos, situate 13 degrees south latitude, lying direct north and south. Their summits do not exceed in height 110 varas; the granite base is surrounded by little rocks exceedingly dangerous for navigation, as a stiff wind called *peraco* almost constantly prevails there, from ten or eleven in the morning till sunset. The reverberation of the soil causes the dust to rise in such clouds that the workmen can only carry on their operations at night.

The guano is in horizontal strata, usually undulated towards the extremities. In the cutting we observed some fissures filled with crystals of ammoniacal salts; we also found in these huameras some petrified eggs, feathers, bones, and even fossil birds.

ANALYSIS OF GUANO.

Our first notions of the nature of guano are due to Fourcroy and Vauquelin. In a sample brought by Humboldt from the isles of Chincha they found,†

1. Uric acid partly saturated with ammonia and lime.
2. Oxalic acid combined with ammonia and potash.
3. Phosphoric acid united to the same basis and to the lime.
4. Small portions of sulphate of potash, chloride of potassium, and chlorhydrate of ammonia.
5. A little oily matter.
6. Sand, partly quartzose and partly ferruginous.

The component parts of ammoniacal guano were definitely noted. Since then, small portions of xanthine and guanines have been recognised.

From fifteen analyses made by Mr. Nesbit, of specimens brought from the isles of Chincha, we find the composition of guano as follows: ‡

Organic matter and ammoniacal salts ..	52.52
Phosphate of lime	19.52
Phosphoric acid	3.12
Alkaline salts, &c.	7.56
Silica and sand	1.46
Water	15.82
	100.00
Soluble phosphate of lime (neutral).....	6.76
Insoluble phosphate of lime	19.52
Total phosphate	26.28
Asote quantity	14.20
Asote combined with ammonia	17.32

The guano brought from the beds along the coast of Peru are characterised by their richness in phosphoric acids, and almost complete absence of azoteous matters; whatever may be said in favour of them, it is known that they do not possess the qualities, and consequently the value of ammoniacal guano, into which it enters, independently of the phosphoric acid and azote immediately assimilable by plants. Nevertheless, I do not dispute their fertilising properties; and further, I believe it would be easy to render them ammoniacal by turning to profit the property they possess, when dry and powdered, of absorbing 0.10 to 0.15 of aqueous solutions of sulphate of ammonia or nitrate of soda without ceasing to be pulverulent.

Besides, it is evident that the earthy and ammoniacal guanos have the same origin in the dejections and remains of sea-birds. The absence of ammonia in the first is probably due to local circumstances, such as the abundance and frequency

of rains, which naturally favour the decomposition of organic substances, or the dissolution of the salts at the base of ammonia. Part of the South Sea coast, where the bed of ammoniacal guano lies, exhibits this peculiarity, because over a considerable extent between Tumbres and the desert of *d'Asacama* rain is, you may say, unknown, whilst beyond these limits to the north of Tumbres, in the marshy and impenetrable forests of Choco, it rains almost incessantly. At Payta, situated at the south of that province, when I was residing there they had been seventeen years without rain. At Choco (lat. 7 degs. 46 min. S.), the rain of 1728 was recorded as a memorable event; it is true that it lasted forty nights, but it ceased during the day. The rarity of rain in these countries is attributed to the permanence and intensity of the S.S.E. winds. They blow with the greatest violence during May and June. The sky is then beautifully clear, the temperature low, in consequence of the currents of air coming from the southern Polar regions, which announce the end of summer. They have no storms in that Peruvian coast; a native of *Piura* or *Sechura* who has not travelled has no idea of thunder. However, it is a mistake to suppose that the drought is permanent on the coast. During several months the earth is watered without rain, and the valleys and hills are covered with verdure. Then comes the season when the south wind is replaced by a breeze from the north, scarcely perceptible, so gentle that it is only just sufficient to turn a weather-cock or wave the flags of a ship. It is a slight agitation of air, an uncertain calm, indicating that the S.S.E. wind has ceased.

In consequence of the changes which take place between November and July the atmosphere assumes altogether a different aspect, as the wind returns by degrees to its normal direction, S.S.E. only modified by heat. Then comes winter (*invierno*), when the vivid light with which the country was inundated is succeeded by a twilight most depressing to the spirits. The sky is enveloped by a thick fog, and it is only very rarely that the clouds break sufficiently for the sun to appear. Between the hours of ten and twelve the vapour regularly rises, and remains at a certain height, where it forms a cloud. During its ascension part of the fog falls in rain (*garua*), which waters the earth as gently as a watering-pot. These *garuas*, as the Indians call them, are never sufficiently heavy to render the roads impassable, or even to penetrate the lightest clothing, but by their persistence introduce into the soil sufficient water to render it fertile, keeping it in a suitable state of moisture, till the south wind regaining its strength chases the clouds away. Besides, in some parts of the shore, happily sufficiently numerous, the aridity is only superficial. At a certain depth we encounter a sheet of water that takes its source from the Cordilleras. These rain-waters, which the Andes receive, do not always reach the sea unless they are very abundant; over a space from twenty to thirty leagues they are absorbed by the sand, and, as is the case at *Piura* and *Sechuras*, to find them they must dig to the bed where the torments have drained into. It is owing to this absorption of the arenaceous soil and the frequency of these rains, or *garuas*, that the country between Tumbres and Chili is not altogether a desert.

It is precisely in this zone, where rain is sufficiently rare to be considered an event, between Payta and Rio-Los, that the beds of ammoniacal guano are found. Beyond, more to the north, as well as further south of these extreme points, the guano exposed to tropical rains is generally deprived of ammonia and soluble salts; one insoluble salt resists them—phosphate of lime, the basis and characteristic of earthy guanos.

For the accumulation of guano in such enormous quantities as the *huameras* contain, there must have been a concurrence of circumstances as favourable to its production as to its preservation: an exceptionally dry climate, under which the birds had not to shelter themselves from the rain; some crevices and fissures in the earth and rocks, where they can repose, lay their eggs and breed, sheltered from the strong south breezes; and, lastly, a subsistence, such as they find in the waters that wash the shore. In no other part of the world is fish more abundant. They come sometimes during the night, as I can bear witness, in prodigious numbers, and are stranded alive upon the shore, even when the sea is not rough, as if they were escaping from the pursuit of some enemy.

One of the Spanish navigators who accompanied the French

* The varas is equal to nearly a yard.

† *Annals of Chemistry*, first series, vol. 56, p. 356.

‡ These organic matters comprise uric and oxalic acids.

academicians to the Equator, Antonio de Ulloa, reports that "the anchovies are so abundant on that coast that it is impossible to convey a correct idea of the quantity. It is enough to say that they afford subsistence for an infinite number of birds, which make them their prey. These birds are commonly called *guanar*, amongst which there are many albatrosses, a species of cormorant; but the whole are comprised under the general name of *guanar*. Sometimes they raise themselves from the land, forming a cloud which obscures the sun. The flight is sometimes nearly two hours in passing, without diminishing in numbers. They stretch over the sea and occupy a large space, after which they commence their fishing in a very amusing manner. While sustaining themselves in the air they wheel to a great height, but as soon as they see a fish, they descend, incline their heads, close their wings, and strike with so much force that the splashing of the water may be seen at some distance. They then resume their flight, swallowing the fish. Sometimes they remain a long time under water, and rise a considerable distance from where they dived; doubtless because the fish, in trying to escape, had disputed with him its agility in swimming. This may constantly be seen in places which they frequent: some diving under water, others rising, and, as their number is very great, it is amusing to watch this confusion. When they are tired they rest on the waves: at sunset they re-assemble, and the whole number retire to rest. It has been observed at Callao that the birds which rest in the isles and islets situated to the north of that port, go to the south coast every morning for their fish, and return in the evening to the place they started from. When they begin crossing the port we can neither see the beginning nor end of the flight."

The rarity of rains, the predominance of the south wind, the extraordinary abundance of fish and fishing birds upon that coast, did not escape the observation of the first Spaniards who trod the Peruvian soil. One historian, who was also engaged in its conquest, *Augustino Zarate*, writes in the 16th century: "Those who have carefully examined the subject contend that the natural cause of this phenomenon (the scarcity of rain) is the prevalence of the south wind during the whole year upon the hills and plains, where it blows with such violence that it carries away the vapours which rise from the earth and sea, without which they might ascend sufficiently high in the air to collect and form drops of rain. This wind is also the cause of the waters of the South Sea always running towards the north, rendering it difficult to cross from Panama to Peru."

The valley where Lima is situated, joining Zarate, is most agreeable as a residence, because the air is so temperate, that you are never in any season inconvenienced by cold or heat. During the four months of summer in Spain, it is a little cooler at Lima than at any other time of the year; and in the morning, towards noon, a slight dew falls, similar to the fogs that are seen at Valladolid.....

All along the coast we find fish of all kinds, especially seals, which are the prey of the vultures. There are also some birds called albatrosses, resembling our fowls: they are very common, being seen over a space of 2,000 leagues; they feed upon sea fish."

Under a climate so steady, upon a soil not modified by the corrosive action of rain, along shores where the tides are scarcely perceptible, where the downs are not encroached upon by the sea in any way, the aspect of Nature is unchangeable. In 1832, on shores washed by the Pacific Ocean, I witnessed the same scenes described by Ulloa, Fraiser, and, even before them, by Zarate. Cormorants, flamingoes, and herons spend their time in fishing, as under the reign of the Incas. At *Piura* the water is still found by digging to the bed into which the torrent has drained. At Chocope it has not rained for eighty-eight years. The river Tumbres flows into the sea in the same calm manner; and, perhaps, if we searched well, we should recognise upon its banks traces left by that intrepid band of soldiers who crossed it in 1531, to engage with brilliant success in the boldest enterprise that has ever been attempted. The armies of Pizarro and Almagro passed there, to take possession of Peru; and not one of those intrepid men deigned to cast a glance at these inexhaustible beds of saltpetre, or upon these *huancras*, which are now of more importance than the most productive mines in the new world.

The interesting geological work written by M. Francisco de Rivero gives the following statement of the bulk of guano in the *huancras*, 1844.

	Square Varas.	Cubic Varas.
Southern <i>huancras</i>	713,687	18,842,814
Guano of Punta Grande, and guano already extracted.....	—	6,157,186
Isles of Chincha	1,450,224	38,500,000
Huancras of Viejas y Carretas Balista	—	60,000
		*58,560,000

M. F. Rivero gives the weight of the cubic varas, 1,400 Spanish pounds being 645 kilos. The weight of the guano then still remaining in the *huancras* is 378 millions of metrical quintals.

This estimate does not comprise the deposits to the south of Rio-Loa, because they belong to Chili; nor those which lie to the north of the isles of Chincha, near Payta, where I have seen them resting on black clay schist, whose tops, seen at a certain distance, appear to be covered with snow.

The deposits of guano are so immense, that it is doubtful whether they can be really formed by the excrements of birds belonging to the present epoch. Humboldt was very much inclined to consider them antediluvian, from some beds of coprolites having preserved their original organic matter. He conjectures that an earlier period must be assigned to these deposits, from their being sometimes 30 metres thick, whilst he calculated that during three centuries, the dejections of the birds which frequent the isles of Chincha would not exceed the depth of 1 centimetre.

M. F. de Rivero believes, on the contrary, that that prodigious accumulation of guano is naturally explained by the multitude of *guanar* seen constantly on the coasts of Peru, under the names of *piqueros*, *corrillos*, *gaviotas*, *albatross*, *pagaru-minos*, *patillos*, &c. If now, said he, in spite of the persecutions which the *guanar* have suffered, and still continue to suffer, we see some millions resting on the rocks or on the steep summits of the islets, what must it have been before the occupation of Peru by the Europeans, when they were, we may say, the sole inhabitants of the shore? He adds, that to account for the formation of guano in the isles of Chincha, estimated at 500,000,000 of Spanish quintals, it is sufficient to admit, that without exaggeration each bird deposits every night one ounce of excrement, and that during the whole of the 24 hours 264,000 of these birds operate in these *huancras*. In 6,000 years—(M. F. de Rivero does not date further back than that, on account of the Deluge)—the guano deposited would weigh 381,000,000 of quintals, and we must not forget that to these dejections the remains of birds are necessarily added, 246,000 *guanar* living at the same time on the isles of Chincha is a number we need have no hesitation in accepting, after having witnessed the cloud of winged creatures in motion, of which, to use the expression of Ulloa, "we can neither see the beginning nor the end," which darken the air, and skim the surface of the sea, hindering navigation. This number may elsewhere suffer a kind of control. The *guanar* only fish during the day: at night they retire into the *huancras*. In the hypothesis of M. F. de Rivero, the isles of Chincha receive 264,000; the question is then, whether there is sufficient space for them. If the surface of these isles is 1,450,224 square varas, each *guanar* would then have $\frac{1}{2}$ vara, being nearly 4 square metres, on which it could live at its ease.

Whether the guano belongs to the present epoch or had been deposited at an earlier period, it always presents an enormous mass of organic substances belonging to the inhabitants of the sea, and as the dejections are derived from food, the fish destroyed by the birds have always formed the raw material. All the elements buried in the *huancras* have, undoubtedly, formed part of their organisation, and it is not impossible to estimate the quantity of fish which has been consumed. Setting aside what a sea-bird disperses during respiratory combustion, we are authorised to believe that almost the whole of the waste of food may be found in the dejections, and consequently in the ammoniacal guano, which

* Ulloa, vol. 1, p. 486.

† Zarate's *Histoire de la Conquête de Peron*, vol. 1.

* 14,512,400 cubic yards, or 87,971,300 tons.

is the only other matter the dejections preserved through the effect of peculiar circumstances I have previously insisted upon. Albumen and uric acid have, no doubt, given place to a production of ammonia, or have experienced other modifications, such as we find the azote which enters the fumes of guano, and necessarily in the fish, digested by the birds. A given weight of ammoniacal guano would then be equivalent to a certain weight of fish, into which the same quantity of azote will enter.

Peruvian guano, when it comes to be extracted, if it is not damaged, contains, as we have seen, an average of nearly 14 per cent. azote.

From researches that I made some time ago, I am authorised in stating, that fish when taken out of the sea contain from 2 to 8 per cent. azote.

Thus 100 kilos. of guano would contain the azote of 600 kilos. of sea-fish; and since, in the huancas, before they had been so extensively excavated, there were 378,000,000 of metrical quintals of guano, we should have as an equivalent 2,268,000,000 of quintals of sea-fish.

Such must have been, in fact, the enormous quantities of fish devoured in the course of centuries by successive generations of guano, and the 53,000,000 of quintals of azote which are found there really belong to the atmosphere for azote, as I mentioned some time since, has no other primitive formation; for example, organised beings have in their constitution, independently of mineral salts, some carbon, the elements of water, and azote. The carbon in the carbonates and graphite belong to the oldest formations; pure carbon, such as the diamond, accompanies gold and platinum, in the detritus of granite, gneiss, and the syenites. Water, as we learn from the beautiful experiments of M. M. de Sénarmont and Daurbée, takes an important part in the transformation of the crystalline earth. Azote, then, is the only element of organism not found fixed in rocks of igneous origin; we only find it appear in sedimentary deposits, where there are vestiges of beings having vegetated or respired on the earth; and all this leads us to believe that it has only penetrated into the tissues of plants, and consequently into the tissues of animals, after having been transformed into nitric acid or ammoniacal states under which we habitually find it in the atmosphere.

Like the coal measures, tuff deposits, and diluviums from bones and coprolites, the huancas conceal, by holding them under sequestration, materials of ancient worlds, which man by his incessant activity brings into the modern world. In fertilising a field with their products, we transform into food the excrements of sea-birds. In the same manner, by burning some combustible minerals, we restore to the atmosphere

a portion of carbon from the aqueous vapour and azote which was contained in the vegetation characteristic of the coal epoch. The truth of this was explained with much intelligence by a noted and ingenious Englishman, George Stephenson, on seeing a train advance at great speed, on one of the numerous railroads he had constructed. "It is not," said he, "these powerful locomotives, guided by our clever mechanics, which make the train move: it is the light of the sun, that light which has been for myriads of years disengaging the carbon from the carbonic acid, and fixing it in the plants, while one revolution of the globe has changed it into coal."

The restoration of ancient worlds has not only taken place in reference to the aerial ocean, but also to the soil. The huancas contain some mineral substances, among which we may mention phosphate of lime. In the most ammoniacal guano, obtained from Angamos or from the Isles of Chincha, there is not less than 2.5 per cent. of it; the earthy guanos are almost entirely formed of it; and we may, without any exaggeration, estimate the phosphate of lime from these beds at 95 millions of metrical quintals, or sufficient to form the osseous systems of four billions of men; and yet that is really only a part of the phosphates distributed in the different strata of the geological series. In guano all the phosphates necessarily originate in the fish consumed by the guanos, or (to go further back) in the earth; which led M. Elie de Beaumont to remark, with his usual clear-sightedness, that in organised beings "azote comes from above, phosphate from below."

Materials accumulated from these osuaries of primitive ages, such as we meet with in Jurassic lias, in neocomium, and in green sandstone, as well as in caverns inhabited by generations of carnivora and coprolites, till the year 1847 were merely of scientific interest; but as soon as Chemistry pointed out their richness in phosphoric acid, it was understood that to a certain extent it would act like guano, and from that time it has been sought assiduously. Now, European agriculturists receive these phosphates from the extremities of the world—from the islands of the Pacific Ocean, the Caribbean Sea, the Gulf of Mexico, the coasts of Africa and Australia; and in order to procure it, navigators brave the dangers of the coral banks which at another time they would avoid as too hazardous.

Permit me, in conclusion, to state before the Academy of Sciences, that this grand commercial movement, the result of which is the diffusion of fertilising matters, received its sole impulse from an observation made by an eminent geologist, Dr. Buckland, and the analyses, equally remarkable, of one of its most distinguished members, M. Berthier.

BOUSSINGAULT.

A WORD FOR MANURE.

SIR,—There are few subjects more uninviting to the general reader than the subject of manure. "It 'stinks in the nostrils,'" if it be really good manure. The immense importance of the subject is the only apology I can offer for touching upon it at all.

Manure is a very important part of the food of the plants by which we live; and considered in this light, whether repulsive or otherwise, it has to be grappled with, and turned as best we may to profitable account.

The place for manure is underground. In the dark wet mould it is at home, and there it worketh wonders; and it is there only, and in that buried state, that it can be perfectly transformed, and have all its disagreeable qualities removed. Nature has made a very salutary arrangement to secure the burying of manure by making it ugly and forbidding to the senses; and it has not only the power to annoy us by its presence, but it may even go further, and by its pestilential air produce disease and even death. There are few living men who have had such a fair opportunity of testing the value of manure as I have had during

the last thirty years, for I have carefully read through all sorts of books and papers on the subject, and on the pretended value of the filth and swill of towns, and the ways and means proposed to get this filth and swill of town drainage into poorly manured grass fields, and high up to irrigate dry hill sides. I have witnessed expensive experiments, and have seen gigantic failures. Moreover, my living has depended upon the successful cultivation of plants, from the most expensive to the most common, and such is my dislike of the dirty subject that were I not convinced that cleanliness will never be practised sufficiently unless it can be made to pay, and that cleanliness consists in placing filth in its appropriate site, I would not name the nasty thing, nor be at pains to show how good manure may be neatly buried, and nicely packed off to its place in the red earth, to rise anew in vegetable life, and go the round again.

As regards the subject of the filth and swill of towns, I would beg leave to state the following practical facts. Dirty water is not necessarily a manure at all. In a

commercial point of view, the less water that is in any manure the better. I find by the rain-gauge, carefully noted for the last thirty years, that every square yard of field, garden, yard, area, house-top, street, &c., whether in town or country, fertile or sterile, receives from the clouds annually one cubic yard of water; and, whether in town or in country, the ground has to get rid of this milldam, thirty-six inches deep, either by drinking it in, or by draining it off.

All the manure of a very large town may be got into very little compass, if the water and other extraneous matter were taken away from it. There is a great bugbear in the imaginary size of large towns, and the amount of manure to be got from them. It is only when we come to figures that the relative proportions of town to country, and of real manure to the water with which it is mixed in towns, can be seen. The largest city or town would only be a small speck in the open country; a single country parish would easily accommodate the English metropolis; the hollows among the Grampians would hold Glasgow and Edinburgh; Exeter might be scattered over Dartmoor as farm-houses; Bath and Bristol would not cumber Salisbury Plain; Dublin city, suburbs and all, would be quite lost either in the Bog of Allen, or on the Curragh of Kildare; Belfast and Derry, if both translated to Connemara, might have front gardens to every house, and there would still be hundreds of acres to spare. The grass grows pale in the open country for want of the filth that disgusts you in the town; to the farmer and gardener "muck is the mother of money." The system which I am about to detail was practised thirty years ago by a millwright in Aberdeen, where workshop and house were situated rather awkwardly for the sanitary work of cesspool clearing, and the removal of night-soil from the premises; but when he had cased the cesspool fluid in wood, and buried it and the nightsoil in dry ashes, the manure could be removed to the garden, or to the farm in open day, without offence to sight or smell, just as any cask of cement or drysaltery could be carted.

If an ounce of Prussian blue were put into a hogshed of water, it would so stain it that, if we did not know the exact weight of the dyestuff used, we should think this water rich in something; but, after all, it has only the miserable proportion of one ounce of dry goods to ten thousand ounces of water.

Upon every square foot of town area there will fall eighteen gallons of rain-water annually; and this, at 10 lbs. to the gallon, is a weight to be removed uphill or otherwise of 180 lbs. for every square foot of area, or say of 8,500 tons per acre, or three millions of cubic yards of water per square mile; and counting London at forty square miles—that is, eight miles long and five miles wide—there would be ninety millions of tons of water to be taken into account from the rain alone, without the weight of water supplied by the New River, and all the other metropolitan water-works. This item, then, is the weight of the adult rating material with which the London sewage is watered. There can be no wrangling about the data, for the rain-gauge being a tin can, tells no lies, and is biased by no party.

A first-class plant-grower and market gardener, through whose grounds a London sewer lay, would not use any of the sewage, principally, he said, on account of the iron it contained from tiers of wheels and shoes of horses constantly wearing on the stones. When this deluge of water has got the filth of a city like London mixed with it, it may well alarm us to find power to lift it on to dry ground. My business, however, is to show that it is not wanted.

By a beautiful order, Divine Providence has provided us with as much clean water, rained like manna on our house-tops, fields, and gardens, as is necessary for our

use, if we could only husband the store and use it aright. Only think of a tank of rain-water three feet deep, and the size of the ground plan of the house you occupy, and you will see that Providence has made very great provision indeed for your health and cleanliness; and I am not aware of any general deficiency to growing crops from want of water, where the tillage and manure are up to the mark. The air we breathe, or, in other words, the breath of life, is beautifully supplied, and the cool breeze fanning the fevered cheek tells how well the supply has been regulated to the demand.

The supplies of two essentials, then, of air and water need no comment, as they are diffused pretty nearly beyond our control, but it is not so with the unburies filth; and hence we find it not left in doubt, for the bodies of the dead have been buried in all manner of ways, with or without pomp and ceremony, from the earliest times; and even the filth that would have accumulated around the Jewish encampments in the desert was by direct command ordered to be buried. The nightsoil system of a town is such a horrid nuisance to the inhabitants, and such a degrading piece of work to those employed in it, that were it seen or known it would alarm the most callous, and would be considered a fearful punishment for criminals.

The same beautiful arrangement for burying the filth of towns exists, and in as simple and practical a way as the arrangements above detailed for the needful air and water; and since the necessities of our very existence demand the use of fire to a very great extent in our every-day life—for every house has its fire, and most houses have several fires—the produce of these fires, when the fuel has been well burnt, is a perfectly clean ash as dry as fire can make it, and this thirsty article is alkaline, and a disinfectant, and, without either cost or labour, is just in the place where its service is most wanted. In Devon, wood ashes sell at 6d. per bushel, and are kept dry, and put through the drill for turnips, and answer as well as guano. Soot, another household product, is a good manure, and it too will help to cover in or bury the other household manure; and when privy cess-pits are for ever shut up, and a cask used to do the work, we shall find that every household will manufacture a supply of perfectly dry dust amply sufficient to cover in the filth that would otherwise endanger health and offend the senses, not to speak of wasting a manure, about the importance of which there has never been any cavil.

Before going any further, we must distinctly keep in view that we are feeding plants, and that the bread of plants, whether called manure or by any other name, must be finely broken, and that it would be a mocking of their wants to mix their food with substances that could be of no service to them. This paper, then, has nothing to do with the sweepings of streets, cinder heaps, and swill of towns, its object being to secure a supply of unadulterated manure.

A little way down under the earth's surface there is a chemical laboratory, and the sun's influence and the gentle taps of the electric hammer are felt there, and the blade of corn is invited to spring up, and it is crowned with the dewdrop, and the sun paints it green with a dash from the same flagon with which it streaks the rainbow. The theory of putting our household manure into casks for transmission could only now be mooted after guano had paved the way for it, by showing that dung might get so dignified as to be counted worthy of a sack to carry it in. The value of the manure will carry it, and pay handsomely for the packages in which it is carried. Cinders, coal, sand, stones, earthy matter, earthenware, glass, and such hard substances, should never be counted as manure, or mixed with it; and, on the other hand, many articles would make excellent manure if only burnt to a fine ash

powder. It is, moreover, a very cleanly and convenient way of getting rid of untidy lumber, to convert it into dry ashes. The shape of the caak for household manure should be the frustrum of a cone, or what is known as a half barrel. The food of plants becomes more and more valuable to the farmer as its weight is diminished. There can be no cavil about this matter, as it is no novelty, being merely a sorting out of the real manure from the extraneous matter with which it has been usually mixed, bearing in mind that wet household manure may be as effectually buried in a tub, with a covering of ashes, as if it were earthed up in a turnip drill. Rather more than half of the ordinary ash-pit manure of towns is small cinders, and the various articles called rubbish; but a heap of rubbish is not by any means a manure heap. The ashes of every household should be passed through a fine sieve, and all cinders should be burnt to ashes. The packing of goods for transit is always an important part of the business; and in this case the manure, when casked, may be rolled without lifting, and hoisted or lowered, loaded or unloaded, without those offensive displays where it has to be overhauled by shovelfuls. But, besides the value of the manure, and the saving in the cost of transit, the whole character of the article is changed, as it is really disinfected by admixture, thereby saving its best properties for their work in the field, and rendering the task of manuring land infinitely less disagreeable than it has hitherto been. I

have seen the silver of the watch-case in a labourer's pocket as black as iron, from the gas of the manure heap that he was carting away. The simplicity of this system is its greatest recommendation: it is perfectly practicable and self-acting; it wants no expensive machinery, no chemicals to carry it out; in the every-day ash-pit clearing the thing has been so nearly accomplished already that there is little left to be done; and, no doubt, some will say there is really not much of novelty or merit in the scheme at all. I answer that if an ash-pit is open to the weather overhead—which, I believe, in most towns they are obliged to be—the ash-pit will receive in the course of the year a column of water three feet deep, and this water will, in chemical language, “*leech*” the ashes, and thereby render them of no value as manure, and this wet ash-heap, when mixed with night-soil, does not disinfect it, but merely adds bulk, water, and weight to depreciate its value. What I have stated is that a millwright in Aberdeen, thirty years ago, erected, or if you please, invented a dry closet (as distinguished from a water-closet), where, by putting his dry wood ashes carefully into the same tub that he put the night-soil into, the closet was as clean and as free from smell as a water-closet, and the manure could be removed in the caak, and proved itself exceedingly valuable; and I have never seen the thing so well or so profitably done since.

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AVERAGE STRENGTH OF THE WIND.

We discussed in our pages a short time since the average direction of the wind in England. We now propose to say a few words on its *strength* throughout the several months of the year.

If it is not a subject of equal importance with that which formed the theme of our former note, it is not altogether devoid of interest, and will follow its companion with advantage. The subject of the strength of winds is perhaps of more interest to the sailor than to the agriculturist, though to the latter it sometimes becomes a matter of moment to know something about the average distribution of strong winds; to the proprietor of windmills it is of necessity one of grave interest.

In our former note, on direction, we had occasion to point out the urgent need there was for self-registering instrumental aid in following every variation, through night and day, before a true *average* value could be arrived at. But when we come to investigate the wind's strength or force, it is doubly necessary—first, because it is impossible to estimate, without instrumental help, correctly the *absolute* force at any given moment; and, when several observers do so, they almost invariably differ, even in the rough divisions that are generally used.

Sailors, perhaps, are the most expert in expressing by words the degree of force with which the air moves at different times; but it is very plain that such terms as light, moderate, fresh, strong, &c., &c., are of no use in establishing the average strength. Many observers on land, as well as at sea, are accustomed to express the estimated force by figures: thus, calm would be represented by a cipher, moderate by a number from 1 to 2, fresh from 3 to 8, and so on to 6; and to these numbers are assigned values expressed in absolute measure, either in pounds pressure on the square foot, or hourly velocity in miles.

However useful this method may be in general practice, it is evident that where it is possible to get the records of an instrument that measures directly the amount, with as

much certainty as the thermometer shows the degree of heat, the old method offers no temptation to the analyst of meteorological data.

The pressure of the wind is, as will readily be imagined, a function of the velocity. Knowing the former, we can easily determine the latter by reference to the tables of values that have been calculated for the purpose. Generally it will be found most convenient to speak of the pressure or force instead of velocity: we shall confine ourselves, therefore, to that term. But it will be as well that our readers should be made acquainted with the equivalent velocities. A pressure of half-a-pound on the square foot implies a velocity of 10 miles per hour; 1lb. of 12 miles, 2lbs. of 17 miles, 3lbs. of 22 miles, 4lbs. of 27 miles; 5lbs. is equal to 32 miles, 6lbs. to 35, 7lbs. to 37 miles, 8lbs. to 40, 9lbs. to 42, 10lbs. to 45 miles; 20lbs. is equal to 63 miles per hour, and 80lbs. pressure to about 80 miles an hour.

In the following note we shall only consider those pressures that are equal to and above 5lbs. on the square foot, or to 32 miles per hour of velocity.

It might perhaps be as well, before proceeding further, to explain briefly how a measurement of the wind's pressure is obtained in absolute values.

A pressure-plate, one foot square, is placed immediately below, and at right angles to the vane; it is supported in its position by light bars running horizontally on friction rollers, communicating with spiral springs of increasing power. These communicate the action, when the plate is acted upon by the pressure of the wind, to a copper chain which passes down the hollow shaft and over the bottom roller, where it joins a light copper wire communicating with a pencil, which marks the force on the same sheet of paper on which is recorded its direction, a portion of the paper being properly graduated for the purpose into pounds. Clock-work compels the paper to travel along at a uniform rate during the twenty-four hours, a fresh sheet being supplied each day.

Thus a constant record is preserved, not only of the highest and lowest pressures, but of every pressure, together with the time of its occurrence and duration.

Let us now consider some of the results derived from a discussion of these recorded pressures.

During the past twenty years there have been 165 cases where the pressure has exceeded 5lbs. on the square foot; these have been divided to the different directions in the following proportion: 8 to the S., with pressures from 7 to 16lbs.; 12 from the S.S.W., with pressure of 7 to 24lbs.; 35 from the S.W., with pressures averaging from 7 to 25lbs.; 11 from the W.S.W., with the same limits; 18 from W., averaging 7 to 28lbs.; 6 from the W.N.W., from 5 to 15lbs.; 8 from the N.W., 7 to 12lbs.; 1 from the N.N.W., of 6lbs.; 8 from the N., with pressures 6 to 15lbs.; 9 from the N.E., with pressures up to 21 lbs.; 3 from the E.N.E., to 14lbs.; 2 from the E., of 7 lbs. and 9lbs.; and one each from the S.E. and S.S.E., with pressures of 6lbs. and 7lbs. respectively.

There were no instances recorded in which the wind blew with a force equal to or above 5lbs. from the N.N.E. and E.S.E.

The pressures arranged according to amount—not according to duration, but intensity—are distributed in the following way:

From the W. a pressure was recorded of	28lbs.
" S.W. "	25lbs.
" W.S.W. "	25lbs.
" S.S.W. "	24lbs.
" N.E. "	21lbs.
" S. "	16lbs.
" W.N.W. "	15lbs.
" N. "	15lbs.
" E.N.E. "	14lbs.
" N.W. "	12lbs.
" E. "	9lbs.
" S.S.E. "	7lbs.
" N.N.W. "	6lbs.
" S.E. "	6lbs.

Therefore, although the S.W. is by far the most prevalent quarter from whence high winds blow, the W., it

would appear, gives us the hardest gales when they do come.

Examining the pressures independently of direction, we find that out of the twenty years, there was no January in which the wind did not reach 5 lbs.; there were three years in which the April pressures never reached that amount; February and March four each. The next in order of frequency are May, October, November, and December, in which the number of years of no pressures above 5 lbs. are represented by the figures 6, 5, 6, and 7 respectively. The months June, July, August, and September are the most free from strong winds, one half out of the twenty exhibiting none above 5 lbs. on the square foot. Therefore, we see that the month of January is by far the most liable to violent winds, a fact to which the wreck registers bear a painful witness.

Perhaps the most remarkable fact in connection with this subject is the great difference we find between the greatest pressure of one year and that of another; for several years together we shall have no maximum pressures exceeding 10 or 12 lbs., and then a group with maximum values as high as 25 lbs., and even higher. The following statement will illustrate what we mean:

11 lbs. was the greatest recorded in	1851
12 lbs. " " "	1846
13 lbs. " " "	1845, 1848, and 1857
15 lbs. " " "	1853 and 1855
16 lbs. " " "	1856 and 1858
17 lbs. " " "	1844 and 1854
18 lbs. " " "	in 1847
20 lbs. " " "	1859
21 lbs. " " "	1842
22 lbs. " " "	1849
24 lbs. " " "	1841 and 1852
25 lbs. " " "	1845 and 1850
28 lbs. " " "	in 1860

Such are the differences between the greatest pressures of one year and another; but unfortunately we are totally unable to trace any kind of law in this arrangement. Either there really is none, or, which is more probable, our period is not sufficiently long to trace its existence.

USE OF SALT IN THE FOOD OF CATTLE.

The use of salt in the food of cattle must not be looked upon as a direct producer of flesh, so much as a necessary element of the economy, without which animals are apt to perish from disease, but with which the body is kept in a normal and healthy state. Not many years ago a German agriculturist, Ueberacker, brought forward an experiment which is in direct accordance with this opinion. Wishing to obtain some exact notion of the influence which salt exercised upon his sheep, the flocks of which lived upon a low, damp pasture-land, and received habitually a certain dose of salt, he fixed upon ten sheep, and struck off their usual allowance of salt. This remarkable experiment was continued for three years, with the following results: In the first year five of the ten died of rot and worms; in this year the remainder of the flock, 450 head, lost only four sheep. The second year a new lot of ten sheep, deprived of salt, lost seven individuals; the remainder of the flock, 504 head, lost five only; a little later, the other three died also from diarrhoea. The third year was very rainy. Sixteen sheep were selected, and deprived of salt. The whole of them died in the course of the year of rot and vermicular pneumonia. In the Brazil and Columbia, flocks may be annihilated by being deprived of salt: here we have an example of the same thing happening in our own latitudes.

M. Gerriott, member of the Agricultural Society of Lyons, assures us that the milk of cows subjected to a daily allow-

ance of salt is richer in butter and cheese than when these same cows are deprived of salt.

Sinclair, to whom agriculture owes much useful information, has observed that the habitual use of salt has a marked influence in improving the quantity and quality of the wool of sheep. This is in accordance with Boissiaugault's experiments on bullocks. Sinclair goes still further as concerns pigs. Some of the fattest pigs killed in Ireland, according to this observer, are those to whom a certain portion of salt is regularly given.

Many other English agriculturists have proved, by direct experiments, that a regular distribution of salt to cattle is especially useful in preventing hoove (meteorisation), caused by feeding cattle with leguminous and cruciferous vegetables. And there exists no doubt among those who have tried it, that when employed in proper quantity it increases the appetite, stimulates digestion, keeps up the normal supply of salt in the blood, improves the wool or hair of the cattle, prevents disease, and, moreover, enables the agriculturist to fatten cattle upon food which they would not enjoy without it were previously mixed with salt. Dr. Dessoir, in his treatise on the Use of Salt for Cattle (to which the Academy of Medicine of Brussels awarded a gold medal), has arrived at the conclusion that "the regular and reasonable use of salt in the alimentation of cattle may increase indefinitely every branch of

agricultural produce. It is on these grounds that the practice of giving salt to cattle has become so extensive of late years.

But there is another important consideration with regard to the regular distribution of salt to cattle. I allude to its influence in preventing disease. Its daily use becomes of serious consequence when flocks and herds are menaced with those epidemic attacks which too frequently ravage a whole country at once, when a proper use of salt would either prevent them entirely, or at least reduce them to less disastrous proportions. During one of the worst of these epidemics, which sprang up, if I remember rightly, about the year 1840, in the East of Europe, the almost-wild cattle of the Ukraine, Podolia, and Hungary were struck down in much greater numbers than those of Silesia and Bohemia, where the cattle-breeders habitually distribute salt to their beasts. Advancing towards the West, this scourge diminished in intensity, and finally ceased to show itself in Germany, where particular care is bestowed upon cattle, and where salt has been for many years constantly employed. But, whatever be the nature of the disease which threatens, animals are much less disposed to contract it when the body is in perfect health; and we have seen that this is impossible, unless the individual receives each day his proper proportion of salt.

Here naturally arises the question, Do not the vegetables and herbs eaten by cattle contain the necessary proportion of this substance, in their natural state? If so, why do the wild cattle of the plains travel thousands of miles to find it? Wherefore the instinct which causes cows or sheep immediately to put their tongues to the lumps of rock-salt lying in the manger? And why are such baneful effects observed when animals are deprived of salt? No: vegetables do not generally contain sufficient salt to supply the wants of the animal economy, though each plant contains enough to administer to its own wants. But the profusion with which Nature has spread this useful mineral throughout the earth, easily supplies this deficiency.

Our English agricultural journals have more than once drawn attention to the fact that a constant supply of salt, in moderate doses, hastens the development of the colt, and promotes muscular power in the horse. It has been also asserted that the custom of salting the food of horses presents the same advantages we have enumerated above, besides rendering this animal less subject to inflammation of the stomach, indigestion, broken wind, worms, periodic flux, and phymatosis (water in the legs). In the same manner it has been spoken of by authors well worthy of credit, as preserving oxen from inflammation of the intestines, meteorisation, acute indigestion, chronic indigestion, phthisis (consumption), typhus, and the formation of egagropiles (calculary formations in the intestines, having for origin a few bristles, hairs, or fragments of plants). In sheep, experiment has shown us that the habitual use of salt has an extraordinary influence in the prevention of cachexy (rot, &c.), giddiness, worms, parasites, &c.; and in swine it appears to prevent hydatids and some other disorders.

Such are the diseases from which the habitual use of salt has proved itself a preservative; and "Prevention is better than cure," says the proverb. I could mention several others upon which salt is supposed to have a beneficial action, either as a preservative or a medicine; but I have preferred restricting myself to the above, as being the result of direct observation, by comparing cattle fed with slightly-salted food with those taking food without salt.

Of late years an excess of rain in the plains of Derry has given rise to numerous cases of rot in sheep. This disease makes frequent and disastrous ravages among the flocks of that district, principally because few of the farmers have as yet decided upon the constant use of salt. This state of things brought forth an interesting paper by M. Annemie, an agriculturist of much experience, in which the author states that he prevented this terrible disorder in his flock of 800 sheep, by putting blocks of rock-salt within reach of the animals. "They did not fail," he observed, "to go and lick it several times a day. The whole of the flock was remarkable for its perfect health and the fine quality of the wool." The author strongly insists upon the necessity of rendering the use of salt in the feeding of sheep a commoner practice than it has hitherto been in France.

When salt is given for the first time to sheep or oxen, in

whatever shape it is administered, they never fail to give evidence of their delight in the taste of this substance. When it is given as a medicine, either to prevent disease or to combat an illness, it acts better when given pure; but where it is administered regularly every day, or three times a week, as part of the diet, it is preferable to mix it intimately with the food, whether the latter be raw, fermented, or cooked. I have never known a single case in which cattle habitually receiving salt could be observed to waste their fodder, or to leave quantities of it untouched in the manger.

It is now time to fix, if possible, the proper quantity of salt to be distributed regularly to cattle, in order that they may derive the greatest possible advantage from it, and, above all, to avoid excess. This is not an easy question, not is it one in which I can rely exclusively upon personal experience in order to establish once and for ever the proper dose of salt for the various species of cattle and domestic animals of our farms. I shall endeavour, therefore, to avail myself of the experience of others, and of continental agriculturists as well as English.

In Great Britain, in the best-farmed districts, we find the allowance of salt oscillating around the subjoined figures, taken as a centre or basis:

ALLOWANCE OF SALT PER DIEM.

Calf, six months old	1 ounce
Bullock or cow, one year old ..	3 "
Oxen, fattening	6 "
Milch cow	4 "

In Belgium there exists a legal allowance of salt, that which is intended for agricultural purposes being exempt from the tax levied on the other; and the law fixes for oxen a dose of 2 1-10th os. per head per diem. This is too much for young calves, and too little for bullocks, according to English and German practice. Moreover, the Belgians mix their untaxed agricultural salt with gypsum or chalk, in order to render it too impure for other purposes, before distributing it to the farmer.

HORSES.—It is generally admitted, wherever salt forms habitually a portion of the horse's diet, that this animal amply repays the slight additional expense or trouble thus incurred. To mix salt with the food of the horse, colt, ass, or mule, is a frequent practice in England and America. In these countries the usual allowance for a full-grown horse, of middle height, is about 2 os. per diem. In Belgium, the quantity of salt appropriated to a full-grown horse by the Government is little more than 1 os. per diem.

SHEEP.—The Romans gave to their flocks of sheep, every fifth day, an allowance of salt amounting to about half an ounce per head; and this is precisely the quantity which is still employed in England and Saxony daily, for sheep full-grown and of ordinary size. Numerous experiments have proved that salt is more beneficial to sheep than to any other species of cattle.

PIGS.—The best proportion to adopt as a basis appears to be about one ounce of salt to every 12lbs. of their wash, or two-thirds of an ounce per head per diem for full-grown pigs. In cases of anticipated disease, the dose may be slightly increased.

In administering salt, unless it be used as a medicine, the more intimately it is mixed with the food, the better. This is not an easy matter with fodder, especially that which has been salted to preserve it, in which case we must endeavour to make a rough estimate of the amount of salt in a given weight of the fodder, in order not to administer an injurious excess. In farms where oil or rapecake is given in powder, this being rather an indigestible food, the allowance of salt should be mixed with it, in preference to any other fodder. It is easy to mix salt intimately with any cooked or semi-liquid food.

It should be borne in mind that an excess of salt is injurious to any animal; and that is why I have given the preceding figures as a kind of practical guide. An excess of salt produces irritation and inflammation of the mucous membrane, and causes several kinds of skin disease, especially in sheep. With horses, an excess of salt has been known to produce dysentery; and in oxen, diseases of the blood.

Moreover, salt should never be given to cattle when a deficiency of food does not enable them to receive abundance of nourishment; in which case we excite an appetite, without

satisfying it, and the animals lose flesh rapidly. Salt is to be prohibited, also, wherever congestion of any important organ is observed, or where we have perceived inflammation of the bowels, of the liver, bladder, or womb. In such cases we must not be guided by the instinct of the animals themselves, which generally attracts them to salt.

In some diseases of the digestive organs salt has proved beneficial. Thus, in cases of rot in the liver, accompanied by loss of appetite, paleness of the membranes, swellings under the throat, &c., Mr. Tanner recommends salt. He says: "Avoid ground which communicates the rot, and give the sheep a free supply of rock-salt, except when breeding and in milk." And for the treatment: "Give iodine of iron five grains, spirits of turpentine half an ounce, twice a day, and let the sheep have free access to salt." And again, for the disease called "red water," a species of dropsy: "Liberal supplies of food, a dry resting-place, and the use of rock-salt." For numerous other disorders in the treatment of which salt may be advantageously used, I must refer to some of the latest treatises on veterinary medicine.

Considered as a medicine, salt purges animals at the following doses:

Horses	..	..	..	8 to 10 ounces
Oxen	..	..	..	10 to 16 "
Sheep	..	..	..	2 to 3 "
Pigs	..	..	..	2 to 3 "
Dogs	..	..	..	1 to 2 "

It becomes a poison at the following doses:

Horses	..	..	..	2lb.
Oxen	..	..	..	3lb.
Sheep	..	..	..	6 to 8 ounces
Pigs	..	..	..	4 to 6 "

I have now given all the details I consider necessary with regard to the use of salt for cattle, and figures which will enable these notions to be put in practice without danger, by any who have not yet had an opportunity of judging for themselves. If I have entered into too many details, it is because I believe that we cannot too strongly call the attention of the practical farmer and the veterinary surgeon to the subject of this essay.—*Dr. Phipson's Prize Essay on Common Salt.*

MANCHESTER AND LIVERPOOL AGRICULTURAL SHOW.

The most extensive show ever held by this society was attended on 9th September with all the success in other respects that its best friends could desire. The weather was very genial, the morning clouds and gloom making way for sunshine and warmth. The great area over which the show was spread was thronged all day by visitors, of which one-half, if not more, were ladies, and a grayer-looking or equally large gathering of well-dressed persons is seldom to be witnessed. The long ascending route from the pier to the entrance of the park (in which the show is held) was filled with a continuous stream of people of all sorts and conditions, and the streets were kept in continual excitement, not to say danger, by the traffic of Mr. Train's horse railway carriages and the concourse of ordinary vehicles. The railways from all parts have brought full train loads of country gentlemen and farmers, and amateur agriculturists of both sexes, to swell the society's receipts, and to see more than enough for their money, or to have repaid their attention even if they had all taken lodgings here over night, and spent their time from day-break on the show-ground. The visitors have included a large number of the most prominent of the Lancashire gentry. Among the lady-visitors was the Mayoress of Liverpool, The Earl of Derby and Lord Stanley, M.P., were present in the morning. There were from 18,000 to 20,000 visitors during the day, and the amount received at the gates was over £800.

In the department of implements and machinery, which, on account of the great space it occupied, was the most prominent part of the show, there were among the largest exhibitors—Messrs. Richmond and Chandler; Messrs. Pickaley, Sims, and Co.; Messrs. Keyworth, of Liverpool (who had several chaff-cutters, &c., which were quite new implements); Messrs. Simpson and Co., of Darleston, Staffordshire; and Mr. W. H. Peake, Liverpool. The miscellany of articles shown was extraordinary. There were great numbers of chaff-cutters, corn-crushers, turnip-cutters, ploughs, and all familiar implements of agriculture. The judges of implements are Mr. Thomas Webb, of Tutbury, near Burton-upon-Trent; Mr. Maxwell Scott, Tranmere Foundry, Birkenhead; and Mr. R. Whalley, Bold, near Warrington, with the assistance of the secretary (Mr. Ryder) and the stewards of the department (Mr. W. Rothwell and Mr. J. Russell). In this department there are 1,516 entries.

The show of horned cattle comprised 163 entries, and would compare well in many respects with the best of the shows in past years. The chief contributors included Lady Pigot, of Newmarket, Suffolk, who took a fair share of the prizes; Sir G. Gerard, Mr. R. C. Lowndes, Viscount Hill, of Hawkstone, Shrewsbury; the Hon. Colonel Pennant, M.P., Mr. R. Eastwood, of Whitwell; the Messrs. Atherton, of Speke; Mr. T. Forrest, of Tarporley; Mr. J. Hull, of Kirkham, and Mr. D. B. Davies, of Mere Old Hall. There was a fine collection of roan bulls in the competition for the first premium of Shorthorns; those of Sir B. Gerard, Mr. Davies, and Mr.

R. Barton, of Birkenhead, were much admired. A roan bull, aged one year and four weeks, shown by Mr. C. Gors, of Sealand, was also commended by visitors. A roan bull, shown by Mr. R. C. Richards, of Kirkham, attracted much notice by the richness of its colour. Mr. T. Atherton sent a roan Shorthorn bull calf, six weeks old, which was hardly conscious enough of its double merit in being a second prize winner and also the very smallest competitor, and consequently an object of tender attention from the ladies. The judges in this class were—Mr. J. Grey, Dilston; Mr. J. Unthank, Nethercales; Mr. J. Patterson, Ulverston; and Mr. J. Knowles, Wetherby. There were 223 entries of sheep. Many of the animals were highly praised, especially in the class of Shropshire Down ewes. There was an almost total absence of competition in Southdowns. The judges for sheep were Mr. F. Spencer, Claybrook, Leicestershire; and Mr. W. G. Prosser, Shrewsbury. The judges of pigs were Mr. R. H. Watson, Wigton, and Mr. W. Hassall, of Bubney, Salop. There were 83 entries, and the show was considered to be a very fine one.

The show of poultry was very attractive. There was a very handsome collection of Spanish fowls, game fowls, Cochinchinas, and bantams; also golden and silver pencilled and spangled Hamburgs. The plumage of a large proportion of the birds was remarkably rich. Three Poland fowls, shown by Mr. Dixon, of Bradford, and Mr. Unsworth, of Lawton, received a good deal of notice. There were some beautiful Rouen ducklings, sent by Lady Cust; Mr. Holmes, of Knowlley; Messrs. Longton, of Woolton-hill; Mr. W. Gamon, Mr. T. Crosby, and Mr. J. Foden. Altogether there were 225 entries of poultry. The judges were Mr. E. Hewitt, Birmingham, and Mr. J. Douglas, Ranton Abbey, Staffordshire.

The dog show, though not of great magnitude, was well worthy of its popularity.

The horses were stabled in a large enclosure separated from the rest of the show, and approachable by some pretty-shaded paths. It was a spot of great attraction both for ladies and gentlemen. The department was certainly worth all the attention bestowed upon it, for several of the horses were remarkable in many respects. The thoroughbreds were superb creatures, and the side of the ground which they lined was thronged with enthusiastic admirers. Two or three of the horses were too spirited to admit of a near acquaintance, and by striking out their hind legs, after the fashion of thoroughbreds, they kept a clear space in their rear. One or two horses were blindfolded. There were seven entries, all of them well-known animals. On the opposite side of the ground were 18 ponies, which attracted a good deal of attention. Hitherto the show of these animals has been meagre in the extreme; and, indeed, the class is rarely included in the exhibition catalogue. The result of this innovation, however, at Birkenhead, will doubtless induce the committee of this and other societies to make this for the future a marked feature. There is much need to improve

the breed of ponies as of other animals, and the offering of premiums for competition at agricultural gatherings will do much to encourage breeders. The first prize was awarded to a little dark brown Scotch stallion, offered at sale for £50. As he stood covered up in a large cloth in his stall, surprise was expressed by several gentlemen at the decision of the judges. When, however, the groom uncovered him, and trotted him up and down, it was at once apparent that in bone and symmetry he was peerless. There were other animals possessing more beauty, and amongst them might be mentioned a black Welsh gelding, shown by Mr. G. Moulsey, of Bathia; a small light chestnut mare, said to be of Arabian descent, and shown by Mr. Arrowsmith, of Kinsland, Trannore, an Irish cream-coloured pony, shown by Mr. G. Fell, of Warington; a Welsh mountain pony, exhibited by Mr. W. Hope Jones, of Chester; and a small spotted pony, shown by Mr. W. Rose, of Carnedale Farm, Barnston. At the north end of the ground a large ring was formed by the spectators for the "trotting out" of the various animals. The judges were Messrs. W. Weston, Rugby; G. Long, Spofforth; D. Thomas, Dartington; and Captain Hill, Mossfields. The trial of hunters took place late in the afternoon, and was witnessed by thousands of persons. Several rows of hurdles were put up, and 14 hunters competed. Mr. Musgrave's, of Pocklington, Yorkshire, chestnut gelding Overplus, obtained the first prize; Comet, a beautiful bay horse, worth 800 guineas, and belonging to Mr. E. Dixon, of Chester, the second; Whitelip, a chestnut gelding, the property of Mr. B. C. Naylor, of Hooton Park, Cheshire, the third; while Mr. C. Gresty's (Mid-derwich) Greatheart was highly commended. The decisions separately in this, as in every other class, gave satisfaction to all parties.

The annual dinner was held at four o'clock, in the large refreshment-room. Between 200 and 300 gentlemen were present; the chair, in the absence of Earl Grosvenor, through illness, the President of the year, being taken by the Hon. Wilbraham Egerton, M.P. Among those occupying the head of the table were Mr. John Laird, M.P.; Mr. Gardner (Mayor of Liverpool), Mr. Hind (Chairman of the Birkenhead Commissioners), the Rev. Mr. Tattersall, Captain Hope Jones, Mr. T. Bold, Mr. R. Barton, Mr. H. K. Aspinall, several of the Birkenhead Commissioners, &c.

The formal toasts were duly honoured, and the proceedings were of the usual congratulatory character.

Mr. JOHN LAIRD, M.P., who was received with loud cheers and a shout of "steam rams," proposed "The Health of the Patrons of the Society—Lord Derby and Lord Egerton, of Totton." In speaking of the absence of Lord Derby, he said the noble lord, on account of health, had given up attending such meetings as the present. The company, in drinking the toast, gave an extra hearty cheer for Lord Stanley.

Mr. ROBERT NEILDON proposed "The Healths of the President and Vice-President of the Society." He said, since the union of the Manchester and Liverpool Societies, at the suggestion of Lord Derby (about 15 years ago), every step had been to the united society a decided advance (cheers). The speaker paid a high compliment to the secretary, Mr. Byder.

Captain HOPE JONES responded to the toast.

The Chairman proposed "Success to the Manchester and Liverpool Agricultural Society." He said that agricultural meetings such as this were no novelty in large towns, for all the great towns of the north of Cheshire and the south of Lancashire had been in turn visited by the society. In each town they had been well received, but in none better than Birkenhead. Thirty years ago, when the Liverpool Agricultural Society was formed, Birkenhead was merely a country village. At any rate, fifty years ago there were only something like sixteen houses in the place, and about 110 inhabitants. Through the energy and enterprise of a few individuals, such as their gifted parliamentary representative (cheers), Birkenhead had made most remarkable strides. Agricultural societies, formed on the same principle as this one, had been chiefly useful in encouraging scientific agriculture, drainage, and the manufacture of those implements which would economise labour and greatly improve agriculture itself. The farmers had shown themselves willing to take every advantage of the experiments which had been made

by a few enterprising men of capital, and the consequence was that while they united in these improvements they also derived considerable benefit. Farmers were no longer satisfied with the old and somewhat careless system of breeding, allowing their ground to be covered with weeds, and using rude and inefficient implements (cheers). Taking these things into consideration, agricultural associations occupied a very high ground. Scientific meetings, similar to those recently held at Newcastle, had done much for the cause of science and commerce; but associations like this one had done just as much for agriculture (cheers). This was an additional inducement for gentlemen of means to give the society their liberal support. It was not always, perhaps, remembered that the object of an agricultural society was to make food as cheap and plentiful as possible, and an object of that kind must ever meet with the approval of all classes of the community. Government had recently brought forward the subject of agricultural statistics, and it would be well if the farmers would give their attention to the matter. It was highly important that we should have a thorough knowledge of what grain was in the country (Hear, hear). At present, however, this could not be known. The plan had been tried in Ireland; but the statistics had been collected there by the constabulary. Probably it would not be the wish of the people of this country that the constabulary or overseers should be employed in such matters (cheers). The thing was done better in Scotland, by the Highland Agricultural Society. There could, at any rate, be no doubt whatever that if the work were done in England it could only be accomplished by the voluntary efforts of the farmers (cheers). Every scientific farmer must admit that it was very important agricultural statistics should be obtained—the same as in commerce and science (Hear, hear). At a meeting he attended recently, to consider the necessity of reducing the duty on malt, it was stated that the value of barley now used for malting purposes and for feeding cattle was very great, and it was only the heavy duty upon it which prevented it being used for feeding animals. This was a subject to which the attention of the Chancellor of the Exchequer should be directed, because if the duty were reduced a great point would be gained (Hear, hear). He was exceedingly glad to think that agriculturists were turning their attention to the necessity of providing plenty of cattle for meat food, which, like corn and other products, could not be very well imported (cheers). He begged to remind the members that a society like theirs could do a great deal towards promoting the interests of agriculture by improving the condition of the labourers it employed. In the cottages of the labourers, for instance, there was great room for improvement. The hon. member concluded his speech amidst loud cheering.

Several complimentary toasts were given, and the proceedings terminated.

THE UTILITY OF BIRDS.—That some birds do mischief I should be one of the last to deny; but because some destroy a little fruit, and others a few seeds, to advise their extermination is both a folly and a crime, and contrary to a decree of an all-wise Providence that is not to be set at naught by the limited wisdom of man. Let us but reflect for a moment what the state of the earth would be without the useful race of insectivorous birds with which it is wisely provided. The amazing fecundity of the insect tribes is well known; and, without the aid of birds to keep them in check, the world might become an uninhabitable desert. And, independent of the useful qualities of birds, the melodious voices of some, the beauty or social habits of others, and the graceful elegance of all, are recommendations to arrest the hand of their ruthless destroyer, and call forth an expression of gratitude for the most beautiful part of animated creation, without which the world would lose half its beauty, and the seasons half their charm, and man's existence perhaps become almost unbearable in consequence of the increase of insects and other vermin, with which he would be tormented to a much greater extent than he is now, even with the aid of birds to assist in their destruction.—*Gardener's Weekly Magazine*.

SALE OF THE LATE MR. MAYNARD'S SHORT HORNS AT MARTON-LE-MOOR.

On Sept. the 9th Mr. Strafford submitted a portion of this herd to public competition, in the presence of a large number of breeders of short horns. The herd was bred with great care by the late Mr. Maynard, who commenced it about fifty years ago with his father's stock bred at Bryholme, from which Mr. Charles Colling obtained the dam of Phoenix, the progenitor of Comet (155), which animal, as most of our readers are aware, was sold in 1810 for 1,000 gs. Judicious selections have since been added from other herds, including specimens of Mr. Bates' blood, Mr. Maynard being a spirited purchaser at the Kirk-levington sale.

COWS AND HEIFERS.

- Red Eyes, red, calved November, 28, 1852; got by Duke of Richmond (7996), dam (Wild Eyes 23rd) by Second Cleveland Lad (3408)—Col. Kingscote, Wootton-under-Edge, 80 gs.
- Blanche, roan, calved June 20, 1853; got by Squire Blanche (12139), dam (Flora) by Crusade (7938)—Hon. and Rev. Jas. Lascelles, 21 gs.
- Lady Roan, calved May 6, 1854; got by Roan Duke (12603), dam (Lady White) by Lord George (10443)—Mr. C. Pechill, Carlton Huthwaite, 25 gs.
- Bonsie 10th, red Roan, calved July 30, 1854; got by Crusade (7938), dam (Bonsie 9th) by Duke of Richmond (7996)—Sir W. Miles, 52 gs.
- Jeannette, roan, calved Nov. 30, 1855; got by Lord Raglan (13240), dam (Jemima) by Crusade (7938)—Mr. C. W. Packer, M.P., Frestwold Hall, 42 gs.
- Cherub, red and white, calved Dec. 20, 1856; got by Crusader (12668), dam (Cherry) by Crusade (7938)—Hon. and Rev. J. Lascelles, 32 gs.
- Grey Eyes, light roan, calved Feb. 8, 1857; got by Crusader (12668), dam (White Eyes) by Lord George (10443)—Duke of Devonshire, 54 gs.
- Blaze, roan, calved Feb. 16, 1857; got by Crusader (12668), dam (Blanche) by Squire Blanche (12139)—Sir W. Miles, 41 gs.
- Young Points, red and white, calved July 4, 1857; got by Crusader (12668), dam (Points) by Boccaccio (7838)—Sir W. Miles, 55 gs.
- Water Maid, rich roan, calved September 11, 1857; got by Marc Antony (14895), dam (Water Witch) by Squire Blanche (12139)—Mr. Barclay, Keavil, N.B., 105 gs.
- Chilton 6th, red roan, calved December 25, 1857; got by Oxford Duke (15036), dam (Chilton 5th) by Crusade (7938)—Mr. James Parr, Warrington, 46 gs.
- Empress, roan, calved April 4, 1858; got by Oxford Duke (15036), dam (Emma 4th) by Emperor (6973)—Mr. C. W. Packer, M.P., 46 gs.
- White Star, white, calved June 14, 1858; got by Oxford Duke (15036), dam (Bright Eyes) by the Third Duke of York (10166)—Mr. Stephenson, Rainton, 45 gs.
- Cherry Cheeks, red, calved August 10, 1858; got by Oxford Duke (15036), dam (Cherry) by Crusade (7938)—Mr. Fergusson, Wyrley Birch, Thetford, 50 gs.
- Lady Bird, white, calved September 4, 1858; got by Oxford Duke (15036), dam (Lady Roan) by Roan Duke (12603)—Mr. C. Clarke, Boroughbridge, 25 gs.
- Jessie, red with little white, calved August 26, 1858; got by Oxford Duke (15036), dam (Jemima) by Lord George (10443)—Mr. D. Neasham, Haughton-le-Skerne, 32 gs.
- Brenda 2nd, red roan, calved December 17, 1858; got by Marc Antony (14895), dam (Brenda) by The Baron (8666)—Mr. T. Greatham, Stainfield, 41 gs.
- Ceres 3rd, red and a little white, calved January 30, 1859; got by Oxford Duke (15036), dam (Ceres 2nd) by Squire Blanche (12139)—Mr. J. D. Dent, M.P., Ribstone Park, 30 gs.
- Rosemond, red roan, calved February 23, 1859; got by Ox-
- ford Duke (15036), dam (White Rose) by Crusade (7938)—Marquis of Exeter, 70 gs.
- Bloom, white, calved Dec. 30, 1858; got by Oxford Duke (15036), dam (Blanche) by Squire Blanche (12139)—Mr. T. Greatham, 26 gs.
- Dorothea, red, calved March 31, 1859; got by Oxford Duke (15036), dam (Dora) by Crusade (7938)—Mr. W. Tindall, Wheatley, 51 gs.
- Bland, red with a little white, calved December 29, 1859; got by Red Duke (18676), dam (Blanche) by Squire Blanche (12139), Mr. Fergusson, Wyrley Birch, 36 gs.
- Young Emma, roan, calved May 8, 1859; got by Oxford Duke (15036), dam (Emma 4th) by Emperor (6973)—Duke of Devonshire, 41 gs.
- Red Moss Rose, red, calved October 8, 1859; got by Oxford Duke (15036), dam (Moss Rose) by Crusade (7938)—Sir W. Miles, 61 gs.
- Water Girl, roan, calved October 28, 1859; got by Oxford Duke (15036), dam (Water Witch) by Squire Blanche (12139)—Duke of Devonshire, 52 gs.
- White Ceres, white, calved January 25, 1860; got by Oxford 2nd (18507), dam (Ceres) by Emperor (6973)—Mr. J. D. Dent, M.P., 33 gs.
- Bright Star, red with little white, calved January 12, 1860; got by Red Duke (18676), dam (Bright Eyes) by Third Duke of York (10166)—Duke of Devonshire, 85 gs.
- Little Dorrit, red roan, calved May 10, 1860; got by Red Duke (18676), dam (Dora) by Crusade (7938)—Mr. T. Barber, Sprotley Rise, 31 gs.
- Certainty, red, calved June 30, 1860; got by Oxford 2nd (18507), dam (Ceres 2nd) by Squire Blanche (12139)—Sir T. B. Lannard, Bart., Belhus, Romford, 27 gs.
- Bonny, red roan, calved June 14, 1860; got by Oxford Duke (15036), dam (Beauty) by Crusade (7938)—Mr. T. Barber, Sprotley Rise, 44 gs.
- Cherry Ripe, red, calved July 4, 1860; got by Oxford 2nd (18507), dam (Cherry) by Crusade (7938)—Mr. J. D. Dent, M.P., 32 gs.
- Lady Richmond, rich roan, calved August 8, 1860; got by Oxford 2nd (18507), dam (Mrs. Richmond) by Duke of Richmond (7996)—Mr. R. Sharpe, Courtlands, 50 gs.
- Red Eyes 2nd, red, calved June 8, 1860; got by Red Duke (18676), dam (Grey Eyes) by Crusader (12668)—Mr. Gaunt, Thornville, 51 gs.
- Bliss, white, calved November 23, 1860; got by Oxford 2nd (18507), dam (Bliss) by Crusader (12668)—Mr. Burcham, Thurgarton, 23 gs.
- Gem, roan, calved January 18, 1861; got by Oxford 2nd (18507), dam (Gem) by Oxford Duke (15036)—Mr. T. Greatham, 27 gs.
- Roan Sall, roan, calved December 10, 1860; got by Oxford 2nd (18507), dam (Red Sall) by Roan Duke (12603)—Mr. Trotter, Stones Place, Lincoln, 24 gs.
- Mild Eyes, roan, calved April 28, 1861; got by Stout (17047), dam (Young Red Eyes) by Oxford Duke (15036)—Mr. Hauloch, Great Ouseburn, 35 gs.
- Polly, red, calved May 20, 1861; got by Oxford 2nd (18507), dam (Young Points) by Crusader (12668)—Mr. G. Hatfield, Braithwaite, Doncaster, 30 gs.
- Winsome, light roan, calved June 2, 1861; got by Oxford 2nd (18507), dam (Beauty) by Crusade (7938)—Duke of Devonshire, 60 gs.
- Water Lass, roan, calved March 10, 1862; got by Oxford 2nd (18507), dam (Water Maid) by Marc Antony (14895)—Mr. Barber, Sprotley Rise, 41 gs.
- Jessica, roan, calved March 14, 1862; got by Le Moor, dam (Jessie) by Oxford Duke (15036)—Mr. R. Sharpe, Courtlands, 28 gs.
- Bonny Star, roan, calved July 23, 1861; got by Oxford 2nd (18507), dam (Grey Eyes) by Crusader (12668)—Mr. R. Sharpe, Courtlands, 70 gs.
- Cherry Mellow, red and white, calved March 25, 1862; got

by Red Duke (18676), dam (Cherub) by Crusader (18668)—Mr. Tisdell, Whitley, 85 gs.
 Princess, roan, calved October 24, 1862; got by Red Duke (18676), dam (Empress) by Oxford Duke (15036)—Mr. Newham, Houghton-le-Skerne, 25 gs.
 Blush, roan, calved May 14, 1862; got by Red Duke (18676), dam (Bland) by Red Duke (18676)—Mr. Chince, 18 gs.
 Clear Star, red, calved May 14, 1862; got by Marton Duke (Bright Star) by Red Duke (18676)—Mr. Harward, Winterfold, Kidderminster, 50 gs.
 Water Nymph, roan, calved March 10, 1863; got by Oxford 2nd (18507), dam (Water Girl) by Oxford Duke (15036)—Rev. J. D. Jefferson, Thicket Priory, 40 gs.
 Heires, rich roan, calved Jan. 20, 1860; got by Oxford 2nd (18507), dam (Rich) by Oxford Duke (15036)—Mr. R. Sharpe, Courtlands, 53 gs.
 Emmy, roan, calved February 26, 1863; got by Red Duke (18676), dam (Young Emma) by Oxford Duke (15036)—Mr. Stamper, Highfield House, 17 gs.
 Cherry Bloom, red with a little white, calved April 11, 1863; got by Red Duke (18676), dam (Cherub) by Crusader (18668)—Sir Tatton Sykes, Bledmore, 21 gs.
 Chilton 7th, red roan, calved April 29, 1863; got by Red Duke (18676), dam (Chilton 6th) by Oxford Duke (15036)—Mr. Shutt, 15 gs.
 Young Ball, roan, calved April 30, 1863; got by Red Duke (18676), dam (Red Ball) by Roan Duke (18603)—Mr. P. Stephenson, Rainton, 6 gs.
 Blossom, roan, calved March 21, 1863; got by Marton Duke, dam (Breeda 2nd) by Marc Antony (1895)—Mr. Greetham, 20 gs.
 Lady Bertha, roan, calved May 28, 1863; got by Red Duke (18676), dam (Lady Roan) by Roan Duke (18603)—Mr. York, Beverly, 16 gs.
 Blande, roan, calved July 10, 1863; got by Red Duke (18676), dam (Bland) by Red Duke (18676)—Mr. Ferguson, 10 gs.
 Lady Augusta, white, calved August 17, 1863; got by Oxford 2nd (18507), dam (Lady Richmond) by Oxford 2nd (18507)—Mr. Gill, Grimston, 10 gs.
 Egenie, red, calved September 8, 1863; got by Red Duke

(18676), dam (Empress) by Oxford Duke (15036)—Mr. Cropacke, M.P., 10 gs.

BULLS.

Oxford 2nd (18507), red roan, calved December 6, 1857; got by Oxford Duke (15036), dam (Moss Rose) by Crusader (7938)—Sir T. B. Leonard, Bart., 31 gs.
 Red Duke (18676), red, calved February 10, 1853; got by Oxford Duke (15036), dam (Ceres 2nd) by Squire Blanche (12139)—Mr. Kearsley, Ripon, 31 gs.
 Red Gauntlet, calved June 10, 1862; got by Red Duke (18676), dam (Red Ball) by Roan Duke (18603)—Rev. Mr. Powell, Ripon, 21 gs.
 Rose Duke, rich roan, calved May 14, 1862; got by Marton Duke, dam (Red Moss Rose) by Oxford Duke (15036)—Lord Stourton, and W. Henlock, Great Ouseburn, York, 45 gs.
 Pontiff, roan, calved August 18, 1862; got by Oxford 2nd (18507), dam (Young Points) by Crusader (12668)—Mr. Godfrey Wentworth, Woolley Park, 30 gs.
 Jerry, red, calved April 10, 1863; got by Red Duke (18676), dam (Jessie) by Oxford Duke (15036)—Mr. Christopher Clark, Boro-bridge, 36 gs.
 Jeannotte, roan, calved June 20, 1863; got by Oxford 2nd (18507), dam (Jeannette) by Lord Raglan (18240)—Mr. Grimes, Eastkeale, Lincoln, 20 gs.
 Checkmate, roan, calved October 10, 1862; got by Oxford 2nd (18507), dam (Ceres 3rd) by Oxford Duke (15036)—Earl of Crawford, 36 gs.
 Squire Sonsie, red, calved June 30, 1863; got by Red Duke (18676), dam (Sonsie 10th) by Crusader (7938)—Mr. Buttery, Helperby, 15 gs.
 Lord Blanche, roan, calved July 6, 1863; got by Red Duke (18676), dam (Blaze) by Crusader (12668)—Mr. Isaac T. Shutt, Harrogate, 11 gs.

SUMMARY.

57 Cows and Heifers	£2,290	1	0
(Average £40 3s. 6d.)			
10 Bulls.....	263	11	0
(Average £26 7s. 1d.)			
	£2,553	12	0
Average of 67 head.....	38	2	3

STOW-ON-THE-WOLD AND CHIPPING NORTON AGRICULTURAL SOCIETY.

The annual meeting of this society took place on Thursday, Sept. 10th, at Mount Pleasant, Stow-on-the-Wold, and was in every respect the most successful meeting ever held here. The weather was fine, the attendance large, and the stock excellent, bearing ample testimony to the benefit of the society's efforts in stimulating the spirit of improvement among all grades of the agricultural community within the sphere of its influence. The dinner was held at the Unicorn Inn, over which the Right Hon. Lord Sherborne presided, supported by Lord Redesdale, Sir M. H. Beesh, Bart., and a large number of the leading supporters of the society. The quality and quantity of the viands supplied were of the first order, the wines and dessert excellent, and the dinner was served in a manner that reflected the highest praise upon the worthy host and hostess. After the removal of the cloth the usual loyal and patriotic toasts were given and responded to. The judges of stock were Mr. Humphrey Pegler, of Bledington, and Mr. Richard Stowe, of Adlestrop; the judges of horses, Mr. George Garne, of Churchill Heath, Mr. W. Arkell, of Longborough, and Mr. T. Mace, of Sherborne. Implements no show. The following is the award for stock, but the prize list included also a number of premiums to farm servants for meritorious conduct, for which we have no space.

Class 1.—Fat cow, having had a live calf, £5, Mr. G. Garne, Churchill-heath. Bull, cow, and offspring, £5, Mr. Thomas Garne, Broadmore; nine entries. Bull of any breed, exceeding three years, £5, Mr. Thomas Mace, Sherborne. Ditto, exceeding 18 months and not three years old, 1st, £5, J. H. Langston, Esq., M.P., Saraden; 2nd, £2, Edward Holland, Esq., M.P., Dumbleton; four entries. Ditto, exceeding 12 and not 18 months, £2 10s., Mr. George Garne;

commended, Mr. T. Garne and Mr. Richard Taylor, of Kingham; five entries. Ditto, exceeding six and not 12 months, £2 10s., Mr. George Garne; commended, Sir G. R. Phillips, Weston House; four entries. Milch cow of any breed, 1st, £4, J. H. Langston, Esq.; 2nd, £3, Mr. George Garne; commended, Rev. Charles Barter, Saraden; seven entries. Pair heifers, above two and not three years, 1st, £3, Mr. Richard Taylor; 2nd, Mr. Thomas Garne; three entries. Ditto, above one and not two years, 1st, £3, Mr. George Garne; 2nd, £2, Rev. C. Barter; best heifer in this class, £3, Mr. Thomas Garne; five entries. Ditto, exceeding six and not 12 months, 1st, £3, Mr. George Garne; 2nd, £2, Sir G. R. Phillips; commended, J. H. Langston, Esq.; four entries. Sir William Codrington's premium of £5, for the best horned animal in the yard, was awarded to Mr. Richard Taylor, for a heifer between two and three years.

Class 2.—Long-wool ram, exceeding two years, 1st, £5, Mr. Edward Handy, Sierford; 2nd, £3 10s., T. B. Browne, Esq., Salperton; seven entries. Long-wool shearhogg ram, 1st, £5, Mr. E. Handy; 2nd, £2 10s., Mr. W. Smith, Bibury; six entries. Six long-wool theaves, £4, Mr. Robert Lane, Northleach; five entries. Six long-wool breeding ewes, £4, Mr. Robert Lane; two entries. Five long-wool ram lambs, £5 (the gift of Mr. Sewell), Mr. Thomas Godwin, jun., of Swell Wold; seven entries. Oxfordshire Down ram, exceeding two years, £5, ditto shearhogg ram, £5, and six ditto breeding ewes, £4, all Mr. W. J. Bryan, of Southleigh, the only competitor. Mr. Holland's two premiums of £2 10s. each, for Shropshire ram and five ewes, were awarded to himself, the only exhibitor.

Class 3.—Boar of any breed under two years, £3, Mr. W.

Smith, Bibury; six entries. Breeding sow of any age with litter, £2, Mr. J. Johnson, Mangersbury; two entries. Six pigs of a litter, any breed, not exceeding four months, £2, Lord Northwick; 2 entries.

Class 4.—Draught stallion, £5, Sir G. R. Phillips; three entries. Mare for agricultural purposes and foal, £5, Mr. W. Hurlston, Ditchford Mill; commended, Mr. T. Godwin, jun., and Mr. M. T. Meadows, Upton Wold; seven entries. Cart colt or filly, £3, Lord Redesdale; commended, Mr. W. Hurlston; nine entries. Horse or filly, four years old, bred within twelve miles of Stow or Chipping Norton, possessing or promising to possess the qualities of a hunter, £10 (the gift of

Lord Redesdale), Mr. Edward Righton, Bourton-on-the-Hill; four entries. Ditto best hunting mare and foal, £10 (the gift of Charles Vickers, Esq.), Lord Redesdale; commended, Mr. Robert Garne, of Aldsworth; seven entries.

Class 5.—*Estra Stock.*—Prizes of £1 each were awarded to Mr. T. Mace (bull), Mr. G. Garne (breeding cows, and also for breeding heifers), Rev. C. Bantier (heifer), Mr. W. Hemming (breeding sows), Mr. Hurlston (cart filly), and Mr. J. Clayton, Cheltenham (stallion); and a prize of 10s. to Mr. Richard Taylor for a bull calf. There were 21 entries in this class.

AGRICULTURE, COMMERCE, AND TAXATION.

Since agriculture is the ultimate source of all those material products the aggregate of which constitute national wealth, it is necessarily the ultimate source of all commerce which resolves itself into the exchange of those products.

It is equally true that agriculture is the ultimate source of all taxation, for it evidently amounts to the abstraction from the producers of a certain portion of those products.

These relations are evident on the slightest reflection; but they are lost sight of, in the practical details of legislation. We are apt to forget the fountain in tracking the multifarious channels through which it flows; and the more distant these become from the parent rill, the more inclined we feel to attribute the fertility observed to some foreign or unrelated spring of irrigation. For instance, we contemplate a mighty commerce, and, having subjected exports and imports to a rigid analysis, refer them to shipping and navigation as the proximate cause; and in that limited sense we reason correctly; but, if we extend our view to the ultimate cause, it then becomes plain that shipping and navigation are but the vehicles of carriage, and that the substance exported and imported must be referred to some other industry. Reflection thus awakened leads us on a step further, and we connect the exports and imports with manufactures; but at that point very many are prone to stop, few extending the generalisation so as to include agriculture, the first motive-power in the complicated operation. This defective tracing of results to their origin, when it influences the decisions of the legislature, induces to a loose and misleading policy, in which the *apparent* is mistaken for the *real*, and we are deceived into a wrong judgment of the true strength of the chain of industry by badly appreciating its several links. It is in this manner that statesmanship has been guilty of the gravest mistakes, building on shaky ground, to which it has unfortunately ascribed solidity: hence the superstructures raised upon it—attractive and symmetrical to the eye—have fallen, through the insecurity of the foundation.

General propositions, however sound, rarely produce impressive convictions on the public mind. It was a wise remark of the French philosopher, Fontenelle, that, if he had his hand full of truths, he would only allow one to escape at a time. He compared truth to light, and argued that, as a sudden glare compels us to close our eyes, and leaves us for a time in darkness, so the sudden exhibition of comprehensive truths, addressed to those unprepared for their reception, bewilders rather than enlightens. The illustration is happy. Men who can readily master details when presented separately, are confused or puzzled (as the phrase is) when those details are blended together, and so become complex; and the reason is, because the relations of the several parts are not so classified in the mind that each occupies its peculiar and distinctive place. Thus it is that when we see a vast amount of commercial shipping, we refer the wealth, of which it is the immediate and obvious exponent, to the varied machinery of navigation, and forget that it is merely the consequence of some preceding machinery—for instance, that of manufactures; and, if we pause there, we again repeat the first error. We only reach the bottom of the well, where truth lies, by an exhausting analysis, which leads us to agriculture, the ultimate source

of all wealth, and which therefore contains within itself all the elements and all the constituents of shipping and manufactures, and, indeed, of all the useful arts. It is, indeed, the earth, as distinguished from its products, which demands the deepest solicitude of the statesman. There is the seat of wealth, irremovable, indestructible, eternally reproductive, never failing, never deceiving, but always grateful to labour.

It is a very ancient sentiment, that we are apt to think little of the bridge that carries us safely over the stream. We have seen the bridge and the stream from our earliest recollection, and conclude that the service rendered by the bridge is, as it were, a necessary obligation, to which we owe no thanks. We treat the earth with similar indifference, because we are connected with it by a similar familiarity. In this sense it resembles health: we never know its value until it is lost. We impose on it heavy burdens, and unreasonably expect that it will lose none of its fruitfulness. We expose it to all hostilities of competition, and yet expect it to come victorious out of the struggle; and, what is really exasperating, since it adds insult to injury, we speak of free trade as the concentrated essence of legislative wisdom, and make the land the exception to the rule, of which the malt-tax is a sufficient illustration. Agriculture does not ask, nor is it entitled to legislative preferences or even slight indulgences; but it does ask for, and is entitled to receive fair-play among the industries of the country; and it prefers this claim, not so much on account of itself, as on account of the community. Shipping and manufactures have disappeared from kingdoms where they once flourished, but there the land remains; and if its former capabilities are not now developed, it is simply because an appropriate industry has ceased to be applied to its natural qualities, which consequently lie dormant, though ready to be awakened.

Never at any former period of our history did the cultivator do more for land than at present, and never did legislation do less. We do not ask, indeed, for the fostering hand of Government, but we do protest against its vicious interference. If it will not aid, let it not injure. Farmers understand their own business well enough, without seeking advice from members of parliament how best to plough, sow, or reap. We have only to look cursorily at the statutes at large, to be convinced how small and how superficial has been the knowledge of our senators; for each succeeding parliament has devoted the most of its time to expunging or amending the laws of their predecessors. This is sufficient proof of the absence of prospective wisdom; and who shall say that what is now venerated as wisdom will not be ridiculed as folly? Let it be confessed (mortifying as the confession may be) that governments are less ruled by the teachings of experience than by the pressure of immediate circumstances. Ministers in power ask themselves by what political combination can they longest keep their ascendancy; and those in opposition, who desire to displace the holders of power, ask themselves by what political combination they can most effectively expel their rivals: thus, the end in view is not national welfare, but personal or party aggrandisement. This is the cause of the injustice by which modern agriculture is aggrieved. The voting power preponderates with the ten-pound householders of

the towns; and hence shipping and manufactures have a paramount voice in the Commons. If this statement be incorrect or highly coloured, let us appeal to Mr. Gladstone as a witness.

At an interview with a deputation from the Anti-Malt Tax Association the Chancellor of the Exchequer made this remark: "Mr. Pannett has expressed a hope that this question of the malt tax will be treated on the same principles of justice on which I treated the question of the hop duty." Surely nothing could be more reasonable than Mr. Pannett's hope; he had a clear right to expect justice from Parliament, and also consistency in its rules of legislation; and this Mr. Gladstone very candidly admitted. "But," continued the Finance Minister, "when we come to the application of these principles, I must say I was much struck with the expression of a hope that sooner or later the object which you have in view will be accomplished." He then proceeded to explain the sense in which he used the word "struck;" and clearly, from what followed, he was struck with astonishment that the growers of barley should be so foolishly sanguine as to anticipate relief from Parliament as it is now constituted. "I wish first," said Mr. Gladstone, "to call your attention to the fact that the argument in favour of the reduction of the duty does not stand in Parliament in so advanced a position, and is not so sure of a favourable reception, as is the case in this room. If you look back over the parliamentary history of the last five-and-twenty or thirty years, you will see that the repeal of the malt duty has since 1835 been rarely urged; and, indeed, there have been some rather signal instances, connected with quarters of the House of Commons where the agricultural interest has been most largely represented, in which other duties, and not the duty on malt, have been indicated as fit objects, and as entitled to be the first objects of the care of the legislature and the remission of taxation."

Why then does the repeal of the malt tax not stand in an advanced position in the House? Why has interest in the subject slackened since 1835? Let us inquire into these points. The date of 1835 is the commencing series of years of revenue deficiency, which continued uninterruptedly till 1841, when the Melbourne administration fell and was succeeded by Sir Robert Peel, who imposed the income tax to balance income and expenditure. It is very evident that during the six years in which taxes were insufficient, taxes could not be repealed; it would have been sheer folly to have made any such attempt; and especially when Sir Robert Peel was driven reluctantly, as he admitted, to levy a war tax in time of peace, to arrest a course of indebtedness which otherwise would have accumulated from year to year in the future;

as it had done in the past. The remedy was violent, but deemed to be conservative. It did not, however, stand alone; it was accompanied by a complete change in our commercial and fiscal policy, and the authors of it avowed their conviction that it would extricate the nation from all the difficulties created during Lord Melbourne's reign, within the short period of six years. Pending that experiment the farmers were loyally quiescent, abstaining from any act that might by possibility derange the operation. This explains why the repeal of the malt tax was not urged, and is the proper answer to Mr. Gladstone, for the grievance was acutely felt, though no murmur was raised. At the end of the six years we engaged in a Caffre and Chinese war, and the expenditure exceeded what it had been during the time of Lord Melbourne. The repeal of the income tax now appeared hopeless; and, indeed, it was rendered more hopeless than ever by the surrender of income raised by duties collected on articles in which shippers, manufacturers, and traders in general had extensive dealings. They were powerful in Parliament through the boroughs; their votes were more valuable to the ministers of the day than the votes of the farmers or of those who represented agriculture, and this readily accounts for the postponement of the claims of the growers of barley. The income tax was continued to compensate for deficiency of revenue caused by those remissions of taxation conceded to the parties strongest on a parliamentary division. Of course it would have been unpleasant to make such a confession openly; therefore, the argument loudly proclaimed was, that sound policy required the repeal of all taxes on raw material, and thus raw cotton, for instance, was admitted duty free. The very same argument applies to beer; for barley is the raw material of malt, as certainly as cotton is the raw material of calico; but when it is urged it is evaded, since it is obvious that its force cannot be invalidated.

We have selected the malt tax because it happily illustrates the view we desire to present to our readers. The thesis from which we started affirms that agriculture is the parent of industry, the ultimate source of all production, the feeder of every other variety of labour. If you dry up or narrow a fountain, you dry up or narrow the streams that flow from it; and, however you may deepen or widen the channels, these must sooner or later become waterless, should the fountain itself be injured. Or, to drop the metaphor, no trade can permanently flourish if the plough be arrested in the furrow; for the plough is the primary power which gives motion to all industrial combinations—the mighty wheel which drives the whole circulation of labour and exchanges. This we shall endeavour to substantiate on a future occasion.

AGRICULTURAL STATISTICS OF SOUTH AUSTRALIA FOR 1863.

We have received from J. Boothby, Esq., Superintendent of the Department of Agriculture, a report containing the agricultural and live stock statistics of South Australia, for the year ending 31st March, 1863.

LAND ALIENATED.—The area of country and suburban land sold by the Crown up to the 31st December, 1862, amounted to 2,508,851 acres, or 186 acres per head of the population—an increase of not quite half an acre per head over 1861. The above forms but one-seventh of the total area of the proclaimed counties—17,518,720 acres—out of which large areas of arable land may be selected, at present more profitably devoted to sheep pasturage. Outside of counties the land devoted to pastoral purposes, under lease from the crown, amounts to over 30,000 square miles, irrespective of very extensive areas held at present only under claims for leases. The following comparison of land alienated in South Australia and Victoria respectively is not without interest. The population of South Australia, be it remembered, is scarcely more than a fourth of that of Victoria:

Alienated in South Australia 2,508,851 acres.
Alienated in Victoria 4,835,978 "
ENCLOSED AND CULTIVATED.—The total of inclosed land in South Australia is 2,105,877 acres. Inclosed pasture land is returned at 1,611,366 acres, an increase of 223,206 acres, or sixteen per cent. on the previous year. This increase is chiefly through the formation of large sheep paddocks.
Inclosed in South Australia 2,105,877 acres.
Inclosed in Victoria 3,383,066 "

In South Australia land under tillage in 1862-3 amounted to 494,511 acres, or 7,844 acres more than in the previous season.

The following comparison is decidedly in favour of South Australia:

Cultivated in South Australia	494,511 acres.
Cultivated in Victoria	463,300 "
CROPS. —In South Australia no less than 230,160 acres, or sixty-five per cent. of the total area of land in cultivation in 1862-3 was under wheat, against 310,636 acres, or sixty-four per cent. in the previous season. The following is the average yield per acre in South Australia and Victoria respectively:	
	South Australia. Victoria.
Wheat	12 bush. 18½ bush.
Oats	19 bush. 23 bush.
Barley	18 1-5th bush. 2½ bush.
Hay	24 cwt. —
Potatoes	39 cwt. 43 cwt.

LIVE STOCK.—The number of horses in South Australia is stated at 56,251 against 52,597 in the previous year—an increase of 3,654, chiefly in the counties, where horses are displacing bullocks on farms. Cattle is stated at 258,352, against 265,434 last year, a decrease of 7,092 head. A considerable increase appears in the number of sheep, together with lambs, make a total of 3,431,000 against 3,038,356 last season, or an addition of 392,644, or 12½ per cent.

IMPORTANT MEETING OF FARMERS AT WHITEHALL, CARLISLE.

MR. MECCHI ON CUMBERLAND FARMING.

Mr. Mechi, the celebrated "high" farmer, has for some days past been a guest of Mr. Moore, at his country residence, Whitehall, and during his stay he has had several opportunities of witnessing the results of Cumberland farming at various agricultural shows, and giving Cumberland farmers the benefit of his own experience and observation. With characteristic tact and enterprise, Mr. Moore determined to make use of his friend, and on Saturday, September 12, gave his neighbours, all tenant farmers, and about sixty in number, an excellent opportunity of listening to and trying conclusions with the agricultural Alderman. The host of Whitehall invited his guests to dinner, and the banquet being over,

Mr. Moore introduced his friend, Mr. Alderman Mechi, who sat on his right, eulogising his commercial, agricultural, and personal character. He then told the farmers that he had sent for them, not for their personal gratification, but that they might learn something; that they might hear what Mr. Mechi had to say, and if they differed from him, speak out. His object was more for the purpose of getting up a discussion than of a personal character. They had no doubt read Mr. Mechi's books, and had discussed him and his pursuits. Perhaps many of them had said things about him which it would not have been agreeable to Mr. Mechi to hear. He now invited them, as Cumberland men, to speak to his face. Whatever they might say, he was sure his friend would not take offence at it. His good nature was unbounded. He (Mr. Moore) wished he was as amiable as the Alderman. He wanted them to hear him on agricultural matters; to get up a discussion, and to reflect on the result when they left that room. If they did not agree with what he advanced, let them say so, and give their reasons. That was the object of the meeting. He had sixty men in that room whose experience as farmers he would challenge against any other sixty farmers in the kingdom. This was a legitimate, business-like affair; there was no humbug in it, and he hoped they would make the most of it. It was Mr. Mechi's first appearance at Whitehall, but he hoped it would not be his last.

Mr. MECCHI, who was received very heartily, rose and said: I am obliged to my friend, Mr. Moore, for giving me an opportunity of meeting the Cumberland farmers, and especially those who are his neighbours. I have great respect for the north country. I know it has its difficulties. We in the south are in the habit of thinking that everything that comes from the far north, whether men or cattle, are very hardy; that they have been used to hard circumstances, and are able "to rough it," and when they go to the south they manage to make money faster than we do in the south, and to take care of it when they get it. The difficulties connected with the climate, and the consequent hard training, prepare men's minds for whatever may arise; and I believe it is that preparation under difficulties which makes them persevering, patient, and resolute to succeed. We have met to-night to talk agriculture, or about agriculture, but I have said so much on that head during the past few days that I am almost ashamed to make another speech. We are met, however, in a social and friendly way, and shall no doubt,

therefore, be the better able to discuss some points with a view to eliciting the truth. The different counties vary very much in their climate and in their soil, and in their practices. For instance, I know Scotch and north-country farmers when they go south are apt to put their turnips in early in May, as they do here. I could tell them that if they put them in the nasty clayey soil of Essex they would be frizzled up and destroyed. They would get on very well at first, but by the 1st of September, when people went out shooting, they could not get near the birds, because the leaves are so dried up that they crackle like paper. They are dried up. The climate will not permit of early sowing, and the seed should not be put in till the 24th of June. I merely mention this as an illustration of what may arise out of climate and soil. In Essex we have no great hills like you in Cumberland, that stop the clouds that come across the Atlantic. The sun does not come down upon us as with you, through mists, but with its perpendicular rays, and gives us good wheat, with stiff straw, but not grain. We can grow mangold wurzel, which does not require rain, but warmth; it is because we have that warmth that we can grow good mangold wurzel, which you have no business to attempt to grow here. You could grow thirty tons of turnips—Swede turnips—where you could only grow 15 tons of mangold with the same quantity of manure. That arises from the soil and climate. And so as to beans. When I came to the north—in the south we grow splendid beans, as high as myself, and that is over five feet by a good deal, you see—I found that no beans were grown here. I inferred at once that there was a reason for it. I could well understand that your climate was unsuited to them. You have plenty of moisture, which is requisite; but when the flower comes, having too little sun and too much wet, the flower rots so that you do not get pods, though you may get the straw. That is the reason you don't grow beans. You grow grass and you grow clover; but with regard to clover I don't agree with your practice, for I find that instead of using pure clover you sow clover and ryegrass, and keep it down two years. In Scotland it is the same, where they consider it a frugal practice; but it is different from the practice in Essex. We sow nothing but clover (red clover) once in eight years, and white clover once in four years. We mow it and make it into hay, and then let it grow again, feeding that off with sheep, and plenty of cake. You put ryegrass in, which we in the south think the worst preparation for corn, and keep it the second year. In the second year it is filled with a great quantity of weeds—I don't know what they are—(A voice: "Twitch") and you lose a year before you get in your wheat. I take clover for hay, then let it grow high into a good crop, and put sheep on to feed giving them as much oilcake or rapecake as they can eat. What is the result? That land is in such good condition that I take a wheat crop, which is rather too saucy, and has perhaps too much straw. I put in afterwards "Revet" or long-bearded wheat—barley don't do for that stiff land—and perhaps I get six quarters of Revett wheat, in addition to five quarters of red wheat, or eleven quarters in the two years. I sometimes get twelve quarters, always eleven. After that I rest it with a crop of beans, or mangold. I always use guano for the second crop of Revett wheat. We scarify the stubble, rake it all up, burn it, and plough it in, putting on guano. We always manure for the beans, and that manure comes from stock fed with plenty of cake. And this brings me to another question. I saw with sorrow and regret, as I came by railway from London, at the rate of forty miles an hour, that there were no oilcake troughs in the fields for the last 150 miles. Whenever I travel through the country I look for the oilcake troughs. By their presence or absence I know what is going on, and what corn is growing. In Lincolnshire you will see them everywhere; and whatever animals are feeding on, you will always find them feeding

on oilcake. What is the consequence? The result is that the animals are half as long again upon the land, or the land will keep half as many more animals per acre. If you keep the animals on that length of time, the manure follows to the exact number of tails. Then there is another question. The quality of your manure has a great deal to do with the quantity of corn you produce afterwards, and the quality of your manure depends upon the food you give your animals. I could show you distinctly on that question in the results of cattle or cow feeding. You will have two quarters per acre on the side where the cattle have been feeding more than after cow feeding. What does Mr. Jefferson say? He is a man of experience.

Mr. JEFFERSON: I have not tried it as an experiment.

Mr. MORRIS: Well, so much for the quality of food. A friend of mine, who was feeding off some rape, on the one side of the field gave the animals oilcake, on the other side he fed them liberally with barley to the same value. The field was afterwards sown with barley, and it had two quarters more of barley per acre on the part where the animals were fed upon oilcake than it had upon the part where they were fed upon barley to the same money value. That is not extraordinary—looking at the value of each after it is consumed, according to the rule which governs the price of guano—you will see that barley is £1 9s. per ton, whilst oilcake, rapecake, or cottoncake is from £3 18s. to £4 12s. There is no mistake about it that the difference between the two is a difference in manurial value of £5 per ton, and you cannot wonder then that my friend got more corn with oilcake than barley. We are bound in these times very much to make experiments in connexion with agriculture, in accordance with the rules of science. Don't let us do anything rash, and ruin ourselves with the cost, for it is just as easy to try the experiment upon one acre as upon a thousand. If you take the animals and feed one set in one way and another in another, you arrive at a just conclusion; but it does seem extraordinary to me that you use so little oilcake as you do. You don't produce a large quantity of fat stock in Cumberland. Do you, Mr. Jefferson?

Mr. JEFFERSON: Yes, a good deal of beef; in the winter season especially.

Mr. MECHI: What proportion does the fat stock bear to the lean stock? The lean stock has the preponderance.

Mr. JEFFERSON: Yes.

Mr. MECHI: Yes, I have seen it myself. I will tell you how they go on in Norfolk, whence London is supplied with beef and corn. I mix much with Norfolk farmers, and, coming direct from them to your county, I am in a position to draw comparisons. Their climate is very dry; 18 inches is the highest rainfall, whereas the average in Cumberland is 32.

Mr. BLACKBURN: It is known to have been 120 at Keswick.

Mr. MECHI: Yes; amongst the hills there is a very large rainfall, but in the bulk of the county it is 32 inches. You have a great deal more rain than they have, and therefore grow more grass. In Norfolk, a friend of mine, a successful farmer, farms 1,200 acres of land, almost all arable land. It consists of about 100 acres of natural grass, and the rest in artificial grasses, roots, and corn. With this 1,200 acres of land how much oilcake do you suppose he brings on to his farm? Mr. Leeds' oilcake bill was £3,500 in the year, or about £3 per acre. He consumed no less than 350 tons of oilcake on his land. He says: "Sometimes I lose by it, and sometimes I get a great deal of money." He does not expect to gain by the animals, but by the consumption of so much cake upon the land they grow such crops of wheat, and turnips, and mangold wurzel, as would astonish you. It is a light chalky soil, which the animals fill with oilcake, which produces very fine crops of turnips, and enormous quantities of corn and meat, so much so that Norfolk and Lincolnshire have become the butcher's and baker's shop for London. In London at a certain season of the year they talk of Norfolk and Lincolnshire, for most of the beef and corn comes from there. I ask, then, whether it would not pay to use plenty of oilcake in Cumberland; and you being large grass farmers, and having a moist climate, I tell you it would pay. I have seen to-day the farm of our good friend Mr. Foster, of Killhow. I saw many bullocks feeding there, and I said, "Foster, do these have oilcake?"

He said "No," and I said, "Then you don't know your own interest. If you can give them 5lbs. a day you would get so much more manure; you would be able to keep so many more per acre, and your land would be of superior quality, and would produce a greater quantity." The whole question of farming depends upon whether it will pay. I admit at once that anything that will not pay in agriculture is wrong. I have seen enough of this county, and of your system of farming, to know that it would be very much better for more manure. Does anyone differ from me on that point? (Several voices—"No.") And I come to the conclusion that in the way of producing manure, you cannot produce it more cheaply and abundantly than by feeding your animals on cotton or rapecake. You want more manure; you admit that your land would be better for more manure; and I say that it cannot be better secured than by feeding your cattle on that material. Guano is dearer, much dearer. Mr. Lawes has shown you that by feeding on oilcake the land may be improved. It is true it involves more capital to keep so many cattle on the farm, for it is necessary to have the cattle to give the cake to. You must have the money; and if you cannot make the money fit the land, you must make the land fit the money. You know what I said about the man with the three daughters. The result of feeding with oilcake would be that not only will you grow more grass, but when you break it up the produce of corn would be much greater. You could take a liberty with your land which you could not do now. I never expend less than £500 to purchase cake to put on my farm of 170 acres in the year. Supposing I buy £500 worth of cake, I lose 10 per cent. or more on the transaction, but I know that I get much more manure that repays me. That £50 loss in oilcake will bring me a profit of more than £50 in other ways, that will return me cent per cent. for the investment. Who amongst you uses oilcake?

Mr. BOGUE: I should say there is not a gentleman here but uses a little. We all use it in the winter.

Mr. MECHI: Ah, you use it in the winter; but do you use it when the animals are on the grass? There is your weak point. Why not give them oilcake then?

Mr. BOGUE: I'll tell you by-and-bye.

Mr. MECHI: You give them hay and turnips in winter and grass in summer, and find it profitable; and if you found it more profitable to give them cake as well in both seasons would you do so?

Mr. BOGUE: Certainly.

Mr. MECHI: Then I advise you to try it. Immediately try it. I can give you evidence of its success; I promise you it shall succeed. I think it is a weak point in the farming of Cumberland that the summer grazing is not attended with the constant use of oilcake. And that reminds me of another point. In the growing season the grass grows very rapidly; in the months of May and June, when the grass almost outgrows you, it will pay better to bring the grass to the cattle than to take the cattle to the grass. I say that very guardedly, but I will put it in a simple form. It may involve more expense in buildings, though that need not be, as in the summer time the yards are generally empty. My experience is, that when I have a good cut of grass, instead of letting the animals walk over it, sleep upon it, and dung upon it, I cut it, and bring it home, and give them some cake with it. Supposing I were to put it in this way—supposing two months' supply of food, such as that we have just been partaking of by the hospitality of our friend here, were laid upon this clean table or the floor, and supposing we were to stand upon it, to sleep upon it, and dung upon it (laughter, and "You nasty man")—it is the same thing—do you think you would like it as well as when brought bit by bit to you and quite clean? (laughter). There is nothing to laugh at, gentlemen; the comparison is a fair one, the circumstances the same. The practical farmer knows very well that if sheep and cattle run over the grass which they have to eat, they make it in such a condition that it cannot be eaten with such relish as when quite fresh; and but for a shower of rain or two to sweeten it they would scarcely eat it at all, and a great deal is wasted. I look upon this as a vital point. The question is, does it pay to cut a ton of food and bring it home to the cattle, instead of letting them run loose to gallop over their food because the flies bite them? On my farm I grow Italian ryegrass, which I irrigate with a jet. During the summer I have under sheds, under cover, about 80 or 90 young and old bullocks, and I am

sure they do not eat more than an acre per week; but if I were to turn them out upon four acres of Italian ryegrass, I should like to know what amount they would spoil. The mere lying down would spoil a very great deal. People are quite astonished that I can feed so much stock with a farm of 170 acres, 100 and odd acres being in corn and pulse crops. Besides the 80 bullocks I have 100 sheep, and they are kept not by letting them run over the farm; if that were the case, I should not be able to maintain a quarter of the amount. I say I have 100 sheep, and how are they fed? They go on the ryegrass in March. They are within iron hurdles on wheels. As soon as the grass begins to grow rapidly in April and May, when it is too high for them to feed, or to trust them on the feed, when that rapid growing time comes, I am obliged to mow that grass down and put it round the hurdles, and a hundred heads may be seen eating through the hurdles as regularly as if they were drilled. What is the result? On six acres of Italian ryegrass I put these 100 sheep in March, 16½ sheep per acre, and there is plenty of food round for them to the end of July. That is not very bad, you know. I hear gentlemen laugh, and certainly it is something to be pleased with, especially to those who have sheep. This is on some of the poorest land in England, but I am bound to tell you that that land is irrigated with sewage from the farm; and in addition I sow some guano, washing it in with the sewage. I do that after the sheep have been on. I keep my ryegrass two years, and after that the land will grow anything. I first take off a crop of beans, 5 or 6 quarters to the acre; I then put in wheat, which this year yields 7 qrs. per acre, then Revett wheat in corresponding quantity, after which I get 30 tons of mangold. You take turnips, but I take mangold, and have good crops, because the animals are long on the ground, and there are 16 tails going manuring to the acre, instead of only three. In fact, you don't half farm your land, because you don't manure enough. The cheapest way is to produce more manure by giving your stock more to eat, by the liberal use of oilcake, as they do in the south, where there is first-rate farming, and the farmer makes such profits that you find him driving up to your door in a carriage and pair (a voice, "We have none such here"). I was dining with a lot of them in Norfolk last October, and I asked, "How is Mr. Hudson feeding his bullocks?" They said, "He has got great Shorthorns this year." "Well," I said, "what is he giving them?" They replied, "22lbs. of oilcake a-day, half a peck of bean meal, each, and all the hay and turnips they like to eat." You may ask, "What is all this stuff given for?" I tell you, then, that he did not expect to make the profit out of the animal, but he gets it on the increased produce of corn afterwards. Another gentleman at the same time told me that he had got some great Lincoln bullocks, and that he gave them nothing but straw and 28lbs. of cake per day, but plenty of water. A few years ago I went to see Mr. Hudson, of Castleacre. He drove me to his farm in his carriage. On the way I saw 30 five-year-old Devon bullocks as fat as pigs. I said, "Whose bullocks are these?" "Ah," he said, "I did not intend you to see them until to-morrow." "What are you giving them?" I asked. "Oh," said he, "I began with 5lbs. of oilcake a-day, and they are getting 20lbs. a-day now, and they go into the pastures to eat what they like besides." That will no doubt astonish certain people in certain counties; it would in Wales, and I dare say in some parts of Cumberland. Why, I saw on that farm a forty-acre field of wheat with 8½ quarters per acre on it. That was due to the feeding of the bullocks with 20lbs. of cake per day, which filled the soil with rich manure. This is what has made Norfolk what it is—this is what has made Lincolnshire what it is—this is what has made the wolds of Yorkshire what they are. When the sheep are turned upon the land they cram them full of oilcake. Now, gentlemen, this is a long story about oilcake, and you have been very patient, so I'll take a glass of wine and drink all your health. I come now to the landlord's duties. We have a good fellow here (Mr. Moore) who has plenty of money, and quite ready to lay it out where he can get a fair return. I say then, concurrently with this consumption of cake it becomes a necessity for landlords to meet their tenants by providing them with due accommodation for their cattle. The late Lord Leicester (formerly Mr. Coke), to whom the country owes a debt of gratitude that can never be repaid, was a father to his tenantry. He had poor land, and he invited men of capital and intelligence to join with him in improving that land.

He tried to make every farmer a better farmer when he came to him. When a farm was vacant, and a young man applied for it, he would say, "Now, young man, how much money have you got, and how much can your friends raise for you?" The young man would say "So much." "Ah then," his lordship would reply, "that won't suit you; I must try and get you something that will." Lord Leicester would not let him take a farm he had not capital enough to manage, but would say, "You have not sufficient money to manage that farm, but I have a smaller one which will suit you." Bear in mind that if you use oilcake you will want more stock to feed; and so when the farmer went and told his lordship that he wanted more buildings for that purpose, he said—"Well, young man, I'm glad to hear it: you shall have more buildings; and when you get more bullocks I'll put you up another shed." He knew very well that the farmer was improving his land; the more stock the more cake, the more cake the more manure, the more manure the more corn, and the more valuable became the land. By pursuing that noble conduct his lordship raised the rental of the property 800 per cent. in a very short time, and the consequence was so much confidence and sympathy between Mr. Coke and his tenants that they went hand in hand in everything. When a lease expired the farmer went to him, and he said, "Come, we must talk about it; I should like to benefit by the improvements made, but you must benefit too"; and the lease was not handed over to anybody who would pay a higher rent, and who would work all the good out of the soil without putting any in, but the tenant was continued who would farm it well. That was the noble principle upon which Lord Leicester acted, and what was the consequence? If a son was not old enough to take the farm when the tenant died, if he was not experienced enough to undertake the charge, the farm was given into the hands of a relation or friend till such time as the son could assume it himself. This was the fine, noble spirit which influenced Mr. Coke, and by which the rental of the estate was increased £30,000 or £40,000 a year, whilst he kept around him the same family faces in the fathers and sons of his tenantry. My friend Mr. Hudson was one of his lordship's tenants. His son, Tom Hudson—everybody called him Tom—as good a fellow as ever lived, farms 1,200 acres of land. His lordship said to the father—"Of course your son must have land; and the house is not good enough for him; he shall have a new house"; and he built a house that cost £4,000 and more, it has been fitted up by Tom with gardens and parlours for the ladies and all that sort of thing; and when Prince Napoleon went to see him, he said, in great surprise, "Is that a tenant's house?" Here was Tom farming like his father. Mr. Hudson, sen., told me that during his tenancy of 25 years on a farm of 1200 acres, he had expended £70,000 on oilcake, and £50,000 on artificial manures. Indeed, he told his landlord jocularly—"This soil is mine, not yours; yours lies underneath, the top soil is my own." The result of this system was that my friend Hudson bought an estate of his own, and it is not long since I went to one of them and killed 400 pheasants with him. And so we may all get on, with perseverance and enterprise, and by not spending quite so much as we make when we are young men. He (Mr. Hudson) is a man of good judgment, as every man must be who will be successful in business; he must have his head screwed on the right way. I hope that when I come down here again I shall find our friend Mr. Moore scratching his head, and considering the request of his tenants to put up more sheds, and determining to charge only 4½ per cent., and perhaps not that. At all events I shall hope to see that farming is improving. Well, now, having got rid of this oilcake, we will have another glass of wine. Another question arises, which is a delicate one to deal with, as it involves a very great difference of opinion; and that is—I won't call it "thin sowing"—for that is a bad name, but "what quantity of seed ought to be put into the ground, per acre?" of course according to climate and circumstances. I know what your climate is here. I have been looking at your wheat crops, and have seen a great many, what we call "springelings" in Essex. Many of the ears are not longer than my finger nail. When I see that, I know that the plants have been fighting for food. If you put twenty horses into a field where there is only food for two, there would be sure to be fighting as to which should have the biggest share, and the weakest would be starved out, and resemble these "spring-

ings." That is my opinion of a great deal of the corn crop in Cumberland; but I would not advise you to go rashly to work and change your custom; but as you are bound in duty to yourselves and to agriculture to make what improvements you can, say that you will try half an acre with less seed than you now sow, by way of experiment. If you now sow one Carlisle bushel, which is three imperials, take off one-third; I would have you to measure them, and see if there would be any difference in the result. I tried one bushel against two bushels on the acre of land. The difference between the one and the two bushels was that by putting in two bushels I lost the rest of the land. I then tried one bushel against one bushel and a half, but I found that there was not much difference there; but as a rule the four pecks or five pecks seemed to be about the rate according to my general farming. The higher I farm the less seed I put in. If I come again next year I hope you will tell me that you have tried an acre in this way. I have a strong suspicion that I can form an opinion upon the result even now. Mr. Ellwood, of Crosscononby, at the show at Cockermouth, where we talked about a great many things, said he had got some of Hallett's pedigree wheat; he said he had put in half a Carlisle bushel per acre, and had got such a good crop as 6 or 7 qrs. per acre. I have a strong impression that if he had put in a whole bushel he would not have had that. I would recommend the farmers to try it. I have grown Hallett's pedigree wheat with good results. It is a good producer, if you take care to sow good seed, and not too thick. I went to Hallett himself the other day, and I saw that he had put two bushels into an acre. "Why," I said, "your wheat is no better than others." "No," he said, "I did it on purpose to show the contrast in the crops." I say to you farmers of Cumberland, make the experiment for yourselves, and be convinced, for it is a very vital and important question for the British farmer and the British public. Let me ask you a question. How much do you think is the natural increase of ordinary crops throughout the kingdom for every bushel you put in of oats, barley, or wheat?

Mr. BOGUE.—One hundred.

Mr. MACHI.—You say a hundred.

Mr. BOGUE.—The Bible says so.

Mr. JEFFERSON.—Seven.

A VOICE.—Eighty-eight to one.

Mr. MACHI.—Mark you, one gentleman says seven, and another eighty-eight to one. This is a nice illustration. Any more opinions?

Mr. BOGUE.—Thirty to one.

Mr. LAWSON.—Ten.

Some one else.—Ten.

Mr. MACHI.—I see several long heads before me that have as yet remained silent.

Another VOICE.—Forty.

Mr. GATA said they would get about fifty to one.

A FARMER asked if Mr. Machi meant the average of the county.

Mr. MACHI said he would take that.

Several VOICES.—"About eight." "Twelve."

Mr. BOGUE.—What grain do you refer to?

Mr. MACHI.—Wheat, barley, and oats. I'll tell you my opinion by-and-by.

A VOICE.—Six and three-quarters wheat only.

Mr. MACHI.—Does that gentleman alter his opinion about the eighty-eight?

The previous VOICE.—No.

Mr. DONALD.—Seven to one.

Another FARMER said seven to one, and he had applied as much guano to his land as he had been paying rent.

Mr. MACHI, after a pause for further replies, said,—I will tell you what Mr. Caird, who has collected statistics throughout the kingdom, says—that if you sow one bushel or one kernel you get an average of nine, counting the one grain in the nine. Mr. Jefferson, therefore, had guessed it to a nicety. The increase is eight to one. If anyone put a perfect kernel of wheat in the ground, do you think it would only produce nine? How many kernels do you count to the ear?

Several VOICES.—Forty.

Mr. JEFFERSON.—I have seen fifty this year.

Other VOICES.—Fifty-two. Fifty.

Mr. MACHI.—I have known them 110. Do you believe you can put a kernel of wheat into the ground and that it will produce no more than nine? I ask that question.

Mr. BLACKBURN.—It will produce above 100 on good land.

Mr. MACHI.—Does it not branch and tiller?

Mr. BLACKBURN.—It would not produce so many without tillering.

Mr. MACHI: How the deuce is it, then, that when we put grain in we only get nine? How is it? I put one kernel into a hole in the ground, and I get 37 stems, the grains in every ear of which average 50 a head, making a total of 1,850. Here we have 1,850 for one. I want to know, then, how is it that we have only eight for one? That is what puzzles my brain. We take great pains to dress the seed so as to get the best kernels, and why is not the produce more? I will tell you why. It is like the horses in the field. You sow too many, and when they spring up a great battle commences; they fight for their lives till one kills the other, or is half killed. You don't see those that are killed, but the half killed are the seedlings of which I have spoken already. I saw a good many to-day. If your soil is in good condition, and land clean, depend upon it you may safely diminish the quantity of seed sown. What has been said to-night proves that the average increase in this county is nine to one. But what is the case in Russia? I recollect a Russian gentleman coming to me, and he saw a man engaged in the field. He asked me what the man was doing, and I said he was hoeing wheat. He seemed surprised, and I asked him if they did not hoe wheat in Russia. He said "Oh no, it don't pay to do so." I said "Pray sir, what increase do you get upon one grain sown?" He replied—"In the north, on land near to St. Petersburg, we get three-and-a-half, but in the south we get five to one." And how much do you think I was getting from the crop the man was hoeing?—forty to one. Had it not been for that hoeing I should have been in no better plight than others. He (the Russian) did not think it would pay, but you Cumberland farmers would oblige me and your families by making a small experiment by putting in half the quantity of the seed you now sow, if only on half-an-acre, and see if I am not right. If not, I will admit that yours is an exceptional case, and that the rule does not apply to this county. In Warwickshire a great deal has been said about broad-casting, and we in the south think you dreadfully behind-hand in sowing broadcast instead of by drill. I was very much surprised not to see a lot of drills amongst the implements at your show here. I will tell you what occurred in Warwickshire when the drill was first introduced. A friend of mine told his men to put plenty of seed into the drill, as they were not accustomed to the process and enough might not be sown; they were in the habit of putting in one of your Cumberland bushels to the acre; and this was a twenty-acre field. When the field was half sown they found, to their astonishment, that they had only put in half-a-bushel of seed to the acre instead of the whole bushel. My friend then directed the men to drill the other half of the field with three imperial bushels of seed; and at harvest time the thinly sown side produced two quarters an acre more than the other side of the field. Ever since that time only half a Cumberland bushel has been the quantity used in Warwickshire. Think of that! But for that simple accident they would have continued the old system to this day, and lost a vast number of quarters of seed, as well as crop. So that, after all, the advantage of half-a-bushel over a whole bushel was accidentally found out. Broadcast sowing is a piece of antiquity which should be no longer tolerated. Often when I talk to my men and my neighbours, we discuss what pays and what does not pay. It is important to agriculturists to know where the sore places are; and the question is, what pays and what does not. I have arrived at this conclusion that half a crop does not pay. We must have a whole crop or it does not pay. A friend of mine, an excellent farmer, whenever he does not see a good crop coming up, recommends, and puts in another. He won't have a half crop; he ploughed it up, manured it, and put a new crop in directly. Every inch of ground was of value to him. If that gentleman found the mangold wurzel missing, he took boys with cans of water and a half-round trowel, and the man puts in the roots from the over-crowded stretches, the boys pouring in the water, and you could not see where they had been planted. He says "We pay for the land, and we must have a crop, everywhere." There are one or two other little things which I would mention before I conclude. I think you should have more efficient fences. As I came along the railway to this place I saw some good fences, very good fences, and the wonder is that all the others I have seen are not

like those. Would it not pay the farmer to keep his fences as good as the railways, instead of their being as they now are, topheavy, with large holes in their bottoms for anything to run through? When we remember that there are 56,000,000 of acres of land in this country, it becomes a serious question, even as 56,000,000 pennies, though a penny might be a trifle, would amount to a large sum of money. I am glad to have had this opportunity of talking about agriculture, and its profits and losses, and I think I may be sure of having convinced you of some things. I think I have shown that it does not do to grow weeds. You should only have one crop of corn; if it is a crop of corn it should be left to itself. If you get a lot of weeds amongst your crop, it is like sitting down to dinner and having a lot of other chaps that you don't like to dine with you. We must all rejoice to see such men as Mr. Foster and Mr. Moore coming down in after-life to their native country; men who, now that they have acquired money, have a happy knack of spending it amongst their friends and neighbours, and at home. I should like to see more gentlemen following their example, and more English money spent in England. It grieves me when I see a foreign Emperor coming here and getting millions of money. Whenever a poor devil—I beg pardon—monarch is out at elbows or breeches pockets and wants to buy cannon to fight us with, he comes over to England and gets his two or three millions. It is true, some of them pay interest for the money, though some of them do not, and if we had that money so lent spent in this country, a great deal more labour would be employed, and the country benefited. Here we have a gentleman coming down from London to the place of his birth, and building a handsome hall, and living there. I rejoice to see capital flowing out of the towns into the country. The more the population is employed the more they will consume, and the more food will they require. If not employed they would not become purchasers, but a burden upon the country. I believe the time will come when agriculture will seek for the surplus accumulations of money in the towns, and when landlord and tenant will set their heads together to raise money and apply it to their mutual advantage. I know many respectable tenants who say "I only wish I had the money to do these things, and I would do them willingly. I have offered my landlord 6 per cent. to put up covered sheds like yours, but he won't." I say, then, it is very pleasant to see our friend here improving his estate. I am sure he will find it far better than spending his money upon things abroad. Before I conclude I want to know if you are satisfied with things as they are; and whatever your answer, my advice is never be satisfied. A gentleman here tells me that Lord Granville is a milkman; that he keeps 140 cows, and that every cow brings him in £40 a-year, which is £5,000 a-year. He supplies milk to the Londoners, and goes direct to the consumers, and does not allow any intermediate profits. Now, I do hope that every gentleman who may take exception to what I have said, will express his opinions, for whilst this is a "free and easy," it is also a business, meeting. I don't come here presuming to instruct you, and I hope I have not offended you in any way. If you ask me what part of farming is most profitable, I scratch my head and am puzzled to answer. It has been said of me that I have lost my money, and at least done some good by exposing my own errors; and this also have I done—I have drained my land; I have deeply cultivated; I have built cottages for my men, and covered houses for my stock; I do not waste my manure, but keep the good in it, and put it into the land at the right time; I sow the proper quantity of seeds and the proper sort; and if these things are wrong, I want to know what is right. After challenging the farmers to a discussion, Alderman Mechi resumed his seat amid loud applause.

There was a pause of some moments in the speaking; at length, Mr. MOORE proposed the health of "Mr. Jefferson," of Preston Hows, and his brother farmers hailed him as a fit champion to break a lance with the London Knight.

Mr. JEFFERSON thanked Mr. Moore for affording him such a pleasant opportunity of picking Mr. Mechi's brains; he had found it very palatable indeed. The worthy Alderman had this advantage over the Cumberland farmers, he could say a great deal; but the farmers were like the old lady's parrot—they could not talk much, but were devils to think. If he were to attempt to say all he thought of Mr. Mechi's speech he should keep them there till breakfast time next morning. Mr. Mechi had alluded to the moisture of the atmosphere and

climate of Cumberland. In his experience they had never had too dry a summer. It was the rain that bothered them.

Mr. MECHI: Not for grass or turnips.

Mr. JEFFERSON: Not for grass or turnips, as you say; and in my opinion we should stick to those crops more than we do. Mr. Mechi's is an arable farm; I have had the pleasure of visiting it, and the only reason why we cannot compete with him is that we have not the same climate to favour us. We manure as hard as Mr. Mechi, but have not his warmth and geniality.

Mr. MECHI: There is the oilcake.

Mr. JEFFERSON: Yes, and we use a good deal of cake, too. I don't believe in 28lbs. of oilcake for one cow. That is not what the chemists tell us; they say that only a certain proportion of any food eaten by an animal can be appropriated to the formation of flesh.

Mr. MECHI: I did not say they appropriated it to making flesh, but only that they ate it.

Mr. JEFFERSON: Well, then, if 28lbs. be consumed, 6 or 7lbs. only could be appropriated, and the rest goes in manure; so that 21lbs. is reduced to manure at £10 to £11 per ton, which is a very dear bargain. I certainly think that a little cake pays very well; but when you give such a large quantity at the price it is selling at at present, it is the dearest stuff you can buy. We can buy Indian Corn in Whitehaven at 10d. per stone, whereas we give £11 per ton for oilcake.

Mr. MECHI: But there is the manure.

Mr. JEFFERSON: If the land wants manure, buy guano and put it on; don't waste the manure by putting it through a cow. Mr. Mechi referred to growing weeds. I, for one, can't afford to grow weeds; they don't pay. Nor can I grow ryegrass. I never saw it worth £3 per acre. It is grass that nothing can eat, and my experience is that it is the very worst grass we have.

Mr. MECHI: Except with sewage.

Mr. JEFFERSON: With regard to sowing, I use a peck and a-half of barley; from two to three pecks of wheat, according to the season; and one bushel of oats, rather below the average Cumberland quantities, but that is sufficient. I think that sufficient, if the land is in good order; but this extreme thin sowing, I don't believe in it. In Cumberland, at least, if you sow very thin, you will have a very late harvest, if you harvest at all. The thicker the seeding the earlier the harvest. If you sow thin, it fills out into offshoots or diminutive heads that come to nothing; you have lots of hinder ends, and the grain is longer in ripening.

Mr. MECHI: Sow early.

Mr. JEFFERSON: With regard to the capital used in agriculture, about which there is such a variety of opinion, I think there is not one farmer that has land in Cumberland but has one-half too much. That was a very good story that Mr. Mechi told at Wigton about the three daughters, and which I had the pleasure of reading this morning, and there was great truth in it. With regard to cattle on grass, and cattle in the field, it has been tried in many instances.

Mr. MECHI: With cake?

Mr. JEFFERSON: Yes; and I don't agree with Mr. Mechi in giving much cake to cattle on grass, it loosens them too much. I would give them oats with loosening food. This summer stall-feeding has been tried by many clever men I know, and they are giving it up again—I suppose, because it does not pay. I have tried myself, but I could not get men to attend to the stock as I wished. You can certainly keep more stock by keeping it in the house than by turning it on to pasture. With regard to the building of sheds, that is entirely a landlord's question. Many landlords are so very ignorant about farming—I don't mean any personal allusion. If the tenant has been managing his farm well, and has increased his stock; if he went to the landlord to ask him to put up more sheds, he would very likely get the reply—"Well, John, they used to serve in former times; and I don't see any reason why they should not serve you." I think it a very good sign when a tenant wants more buildings: it shows that he is beginning to understand his business, and to improve his land, but the landlords of Cumberland are not so proud of building. As to peas and beans, I have grown them for twelve or fourteen years, but they don't come up soon enough. Beans pay well enough, if they come up in time.

Mr. MECHI: A summer fallow.

Mr. JEFFERSON: I have had a summer fallow, then wheat or oats, but I have never yet got seeds after beans. Some-

times I have had a summer fallow intervening, but I never could get a crop. The reason why, I cannot tell. I have often asked the question, but chemists seemed to be at fault there: none of them could give a reason, and some of the answers I have got in the agricultural journals to which I have written for information were quite ridiculous. Although I have learnt a good deal of chemistry, and admit its importance as applied to agriculture, yet my experience is that one ounce of practice is worth a pound of theory. As to gentlemen farmers, riding in their carriages, we don't produce any of that class in Cumberland, although there have been some importations, but they have generally gone off in a galloping consumption. A man to make a living by farming in Cumberland must live like a farmer, he must work like a farmer—aye, and he must even screw like a farmer, or else he will find the balance on the wrong side of the book at the end of the year. Mr. Mechi has contrasted the difference in the value between a full crop and a half crop: all that is very true; but you must bear in mind the difference required in the quantity of manure to produce a half crop and a full crop. I hope we all know that if a farmer's land won't produce a full crop, let him give it 2 cwt. of guano, let him assist it with stimulants. Mr. Mechi's system, and the circumstances attending it, are so widely different that it would require a whole day to contrast them. If I had never ploughed a single furrow from the time I took my farm 18 years ago till now, I should have been a much richer man than I am. I can get more profit out of a pair of Irish cow's jaws than I could out of an acre of wheat.

Mr. BOGUE said though he had intended to reply to Mr. Mechi, and had taken a few notes of his address as he proceeded, the speech of Mr. Jefferson had completely taken the ground under his feet, for it had answered all the points he had intended to contest. He quite agreed with Mr. Jefferson in not being able to grow grass seeds after beans. He had tried beans, and he had a crop of beans now, but he could not grow grass seeds after them. As yet he had had but little experience in this country, but the greatest fault he had to find with Cumberland farming was the fallow land. He thought that by manuring freely, and using artificial manures, that before twenty years were expired the soil would be greatly improved, and that they should see less of fallow land every year. It was a very tedious thing to wait for two years for a wheat crop, all the while paying a heavy rent. When he was a coffee planter he had to wait three years for a crop, and he thought it a great hardship; and now he certainly did think it a hardship to have to wait two years for a small wheat crop. With the small farmers he was sure it could not pay. He wished all his fallow were turnips: last year they were very good, and he thought it would have paid him better had he missed the wheat crop altogether; for in that year from Christmas up to February beef was very dear, and he had got larger prices for his fat cattle. He saw no reason for such great breadths of fallow as there were, and he had land where he could not grow turnips, and he could not grow wheat after beans. He wished the Cumberland farmers would try it, and he trusted that ere long fallows would be done away with altogether. He had heard a great number of objections to growing Italian rye grass, and some were pleased with it, but he did not think it could be grown with profit in this county. As to feeding cattle with oilcake, that, he thought, was a very paying concern, and should be gone into more. He had himself used a great deal of oilcake, and he found that it fattened the cattle very quickly. He did not say that it made the beef any better, for his experience was that the longer the animals were fed on oilcake the worse the beef.

Mr. MECHI: The butchers don't say so.

Mr. BOGUE: Yes, it makes the beef yellow—at least they say so at Wylton. I grind a great deal of my oats, pulp all my turnips, wash all my straw, and mix them with oilcake. With this I feed my cattle: last year I fed a hundred cattle in this way, and nothing paid me better.

Mr. ISMAY said that he appreciated the instructive speech of Mr. Mechi, but was not prepared to agree with him in all his opinions, notwithstanding he gave him credit for being one of the most distinguished pioneers of agriculture. There was one thing in regard to the cropping which was not applicable to this county, and he warned farmers to avoid "scrudging" the land. To adopt Sir James Graham's advice, he would counsel them to graze far more than to grow corn, whereas Mr. Mechi recommended

them to corn every alternate year. Grazing had paid far better of late years than anything, but as soon as they ceased to grow grass profitably then he would recommend them to plough. As to the use of oilcake, he thought Mr. Jefferson's observations very much to the point.

Mr. GRAINGER said he was no stranger to Mr. Mechi's opinions, having read his books and seen the controversies about his mode of farming in the papers. He had not much to object to in his published opinions, but with respect to thin sowing he had some objections. He had sown with a drill three and a-half Carlisle pecks, but to secure thin sowing he had stopped each alternate spout. The result was that he had been very much disappointed; the harvest was at least a week later, the ripened grain very much coarser, and unfortunately rather less in measure.

Mr. MECHI: When was it sown?

Mr. GRAINGER: About the end of November.

Mr. MECHI: Too late. It should have been sown early in October.

Mr. GRAINGER continued. It had not been confined to one experiment, but two or three have been made, and all with the same result. With respect to grass, he quite agreed with Mr. Jefferson's remarks on that point. Old Cobbett when he came to Cumberland, said, "The climate says 'Grass, grass,' but the people cry 'Corn, corn.'" And he thought old Cobbett was right. Deep draining was very desirable, though he regretted to say that after the lapse of a few years the drains became almost useless, and they grew worse and worse. Mr. Parke's system was the first introduced, and for a time it answered well; but after the lapse of fifteen years it was very imperfect. He should like to have an explanation of that.

Mr. MECHI said it was too true that such was the case on certain soils.

Mr. RAILTON said that he had laid out a great deal of money in farming, but had had no returns as yet. He had heard good farmers say that a fortune must be laid out in farming before they could expect to reap one; so he supposed he should have to do so, and he hoped with success. He was quite aware that some of his goodnatured neighbours would say—"What a fool that fellow is! he will beggar himself," or go off in the galloping consumption Mr. Jefferson had talked about. However, he didn't mind what they said, for he was happy to think that he had had a father before him.

Mr. LAWSON said he did not consider himself a practical farmer, though he thought he understood the science of farming. In 1861 he had no more idea of becoming a farmer than he had of being Emperor of China. He could only tell a short story. On the 4th May, he got on his horse in this neighbourhood, and rode to London, spending 33 days on the way, conversing with labourers on the road, and with farmers when the opportunity arose. He saw a great deal of land as he rode along, and was much struck with the diversity of management, which convinced him that there must be some science in farming and skill. When he reached London he went to see Alderman Mechi's farm; and he was so much struck with the superiority of the produce on that farm that he became enlisted in farming: he determined to become a farmer, and he meant to be a good one.

Mr. BLACKBURN said he had been a Scotch farmer for 15 years, and a great deal of his experience corresponded with that of Mr. Jefferson and Mr. Bogue. He thought that possibly rye-grass could not be grown after beans on account of the want of cleanliness the beans generated; but they could grow potatoes after beans, and still better turnips. With regard to the views expressed by Mr. Jefferson with respect to Italian rye-grass, he mentioned that he had grown it in Kincardineshire. The Duke of Argyll in going to the Kelso Show urged that they should try the Darwinian theory with regard to the cultivation of grasses. That had been done with wheat by Mr. Hallett, who had produced wheat which grew 6 quarters an acre where an ordinary crop would only grow 4 quarters, and which had a greater vitality and greater power of extracting nutriment from the soil. He would rather be in their shoes in Cumberland than in the shoes of Alderman Mechi and the other farmers of the South; for here they could grow crops with which the foreigner could not compete with them. The foreigner competed with the wheat growers, but he

could not compete with the breeders of cattle in the north. He urged more attention to dairy produce. This country pays away four millions a year in dairy produce, which it would be far better to retain among our own farmers. He pointed out the importance of selecting seed for grass lands instead of merely using the sweepings of the hay-loft, saying that cocksfoot and Timothy grasses were found to be the best to grow under irrigation; and having referred to the success of irrigation by sewage in Edinburgh and other places, he said he would recommend the pipe system of sewage irrigation instead of the channel system, as being more economical, and expressed his opinion of the favourable situation of the land for irrigation.

Mr. CALVERT said that he had 118 acres of land, and that he had put as much manure on it every year as he paid rent. He should not object to show even Mr. Mechi his balance-sheet. He wished Mr. Mechi would show him his.

Mr. MECCHI: That I call a pithy speech.

A FARMER: Yes, he has taken the kernel out of your shell, Mr. Mechi.

Mr. MOORE said that he had always been struck, in reading the debates in Parliament, with the wonderful memory and faculty which Lord Palmerston displayed in replying to all that had passed during the night. Mr. Mechi had a good memory, and he would call upon him to reply. He hoped he would answer the plain, straightforward question, "Does it pay?" They did not believe in everything they heard, but they did not see very much.

Mr. MECCHI then replied to the whole company and their objections. They could not grow ryegrass in Essex without irrigation—it was such a thirsty soil, and fond of drink; but give it plenty of drink, and it would return such an amount of wheat as they had no idea of. Professor Way found that irrigated grass contained twenty-five per cent. more nutritive matter than that not irrigated; and if he had pursued his investigations into ryegrass irrigated with sewage, he would have found it still more. His experience was that an animal could eat any quantity of it, and never scour. Italian ryegrass was of immense growth, and of so close growth that a rat could not go into it; and it not only killed its enemies, but ate them up afterwards. Not a dock, not a thistle, nor a bit of twitch or couch grass could live in the field. He had often been asked, "Does it pay?" Does what pay? Does deep cultivation pay? Does plenty of oilcake pay? Does a covered yard pay? Do good roads pay? Does having the buildings in the centre of the farm, instead of at the furthest end, pay? But then, it costs a good deal of money to do all that, they would say. If each particular item in that list paid, if they added them together, would they not pay? Adverting to things he had seen in this county, Mr. Mechi said he had seen Mr. William Lawson's steam engine at work, and he was draining a low place where it used to be a bog. Mr. Lawson was erecting on his farm the best buildings he had seen anywhere. Certain people might shake their heads, and say he was spending a great deal of money; but when these buildings were complete, he knew of no farm buildings so likely to contribute to profit as these Mr. Lawson was erecting. In cultivating his land, he was stirring up soil which had never been moved before, and the result must be, there would be a crop which people would be surprised at. The plough that he was using would go down into the entrails, and let air in where air had never been before. If he knew anything of Mr. Lawson, he would say that he would in the course of a few years so improve the land, that it would be let for a much higher rent than before; but he said it guardedly, because Mr. Lawson was a Cumberland man.

Mr. LAWSON asked if the company believed in the giving of cattle 28lbs. of oilcake in a day, to one beast. He thought that the weak point in Mr. Mechi's speech.

Mr. MECCHI said that he had not given it himself, but had been told that others had given it. He should not give his more than 4lb. or 9lb.; but a tail with oilcake left a mark behind it, which was not forgotten in the corn.

Mr. BLACKBURN did not approve of too much oilcake. They should give no more than the animal's system could assimilate; and he would rather have one ton of the manure used in the North than two made by the cattle in the South.

Mr. MECCHI: If you want to exhaust the soil, apply guano year after year, and you will do it. It gives a flash at first; but by-and-by the reaction will come. Depend upon it, a ton of straw, if ploughed into the land without consumption,

is worth 9s. 6d., according to Mr. Lawes, but if passed through an animal, is worth three times as much. At this moment many Yorkshire farmers are ploughing in muck, instead of manure.

Mr. BLACKBURN said he would rather have five cattle fed upon 4lb. a day than one fed upon 20lb.

Mr. BOGUN thought that, in time, Cumberland would become a great feeding and fattening county.

The discussion was now at an end. When twelve o'clock struck, all the company left.

THE CULTIVATION OF THE HOP.

THE SUGGESTION OF A LONDON PHYSICIAN.

SIR,—During the last twelve months I have had occasion to make frequent visits into the county of Kent, and have taken great interest in observing the progress and general management of the hop.

The harvesting is now going on; and before its completion, I venture to draw the attention of growers to a manifest and universal violation of physiological law, which I cannot but think must exert a very deleterious influence upon the health of the plant. I allude to the practice of cutting away the bine, for the purpose of picking the flowers with greater facility. The period for doing this appears to vary with the season and with the condition of the crop; but in all cases it occurs some weeks before the death of the leaves and the cessation of the circulation in the bine and root.

Now, in the first place, the operation deprives the plant of leaves still actively employed in the elaboration of the sap, which should contribute to the ripening of the crown, and be there stored up for future use. The importance of this autumn sap is acknowledged in every branch of vegetable cultivation. The ripening of the crown of the hop must be as important as the ripening of the stem of the vine. The vine-dresser studiously preserves the leaves until they fall off, and long after the fruit is gathered; nor is the fact entirely neglected by the hop-grower, who leaves the young and prolific plants until frost kills the leaves, with the object of strengthening them for the next season.

In the next place, the operation of cutting away the plant is followed by profuse bleeding from every stem, which is increased during warm and dry weather, and does not cease until cold sets in. A clear, gelatinous, saline, hop-flavoured fluid flows in great abundance, blackens the stems, and possibly kills the plant. The effect of cutting down a vine in the same way would be to destroy its energy for several years, and might also kill it. No amount of manuring would enable it to overcome the weakening effect the next year. Is the effect of this bleeding less upon the hop? Does it not weaken the crown—make it more susceptible of damp and cold in winter? Does it not retard its vigorous and independent growth in spring? Does it not make manure more essential, that the plant may be forced into active growth? Does it not injuriously affect the health of the plant throughout the whole summer, whereby it becomes more susceptible of the various disorders, insects, and climatic influences which are so liable to destroy the crop? Health is the first condition of success in hop cultivation. It will enable some plants to thrive where more weakly ones will fail. In the most adverse seasons there are still to be found plants which have resisted the evil influences.

There is great difficulty in changing fixed habits; and at present I would suggest to the growers to experiment on this point. On alternate rows or hills, or on patches of ground set apart for the purpose, I would propose to pick the hops without cutting the bine. This may be done by loosening the poles, turning them round, and depressing them, so that the pickers may clear the plant, and the pole be subsequently restored to its former position; or steps may be employed, to pick the hops without removing the poles. These plans would probably increase the expense of picking; but even if that were doubled, it would not form an important item in the total expense of the crop, and I believe it would be many times saved in the increased health of the plant, and in the increased certainty of a good yield in all seasons.

I have the honour to be, Sir, yours very obediently,
Sept. 15. A LONDON PHYSICIAN.

CORN AVERAGES.

At a monthly meeting of the Winifith Farmers' Club held at the Black Bear Inn, Wool, the subject for discussion was "On Corn Averages," and introduced by Mr. R. Damen, corn-factor, of Dorchester.

Mr. Damen said, in introducing the subject of corn averages, or corn returns, they must not complain if they found the matter rather dry and somewhat uninteresting, especially to the general public; but the club having affixed his name to it during his absence, he felt it his duty to attend, and throw what light he possibly could on the question. The subject was also one with which they were mostly all conversant, and as the facts were few and patent, he should not occupy any great length of their time in its introduction. In the first place, he would say that he did not find so much fault with the present law regarding corn returns as with the method in which the work was done and the law carried out. As they were aware, corn-factors, millers, and maltsters, in commencing business, were required by law to make a declaration, which was tantamount to an oath, that they would make a full and fair return of all the corn they purchased; and that, at the first glance, would seem to meet all the requirements of the case; but there was little doubt that in this respect the law was very generally evaded, for nine-tenths of those entering into the business never made the declaration at all, and nobody asked them; so that with these it was not even a matter of conscience to make the returns. The parties, according to this declaration, were bound to give in a return, showing the names of the purchaser and seller, with the quantity of corn bought, and the amount paid for it, in separate columns. That appeared all very straightforward; and if they failed to make proper returns they were subject to a penalty of £10; but during an experience of about a quarter of a century he only knew of one instance in which anyone was fined for not making returns. They all knew that proper returns were absolutely necessary, for rents were in many parts of the country influenced by them, and tithes generally; consequently, it was highly essential that they should be correctly obtained, in fairness to all classes of the community. He did not advocate anything that was unjust to anyone; and all the producer wanted was that which was fair, and what the law required. The old proverb said, "What is everybody's business is nobody's business;" and this matter being regarded as everybody's business, everybody neglected it. Figures were always very dry and uninteresting, and very few liked to sit down and enter into them. It was said that the nearest way to an Englishman's heart was down his throat, but if they wished to touch his real feelings it was through his pocket; and he would endeavour to show that their pockets were affected in a very serious degree by these returns, and that in a way that they were scarcely aware of. He had very recently had a practical instance of how this was done sometimes. When he was in London, accompanying the deputation to the Chancellor of the Exchequer on the malt-tax question, he had bought a new pair of gloves for the occasion; but when he came to put them on, he found his pocket had been picked, though he was quite innocent of the operation. It was just the same with these corn returns—the money was taken out of their pockets in such an easy way that they scarcely missed it. They were aware that there was nothing new in this matter. From generation to generation it had been continued; for he believed the law had been in existence for a century or two. The negligence in making these returns was so great that they could hardly believe sensible men would submit to it. Many parties made none at all. He knew people who had gone to market for years, and were large buyers of corn; yet they had never made any return at all, and nobody asked them to do so. But in order to show what a deficiency there was in the returns, it was necessary that he should go a little into figures, to illustrate what was the supposed growth of corn in England, what was imported, and what was consumed. The population

of this country was about thirty millions in round numbers; and in bringing figures before them that evening he should deal with round numbers. It was variously estimated what these thirty millions consumed. He believed M'Culloch set it down at one quarter per head per year. This he considered was an over-estimate, and that six bushels a-year were nearer the mark than anything else. Six bushels of wheat would produce about a sack of flour, and a sack of flour would make about ninety-one loaves, which, at 4 lbs. the loaf, would give just 1 lb. a-day to each individual. If they looked at the consumption in their own families they would find this a tolerably correct estimate. Some people thought a greater consumption took place amongst the rich; but he believed it was greater amongst the poor than in either the higher or middle classes, because they lived principally upon bread. But in taking the population at thirty millions, there must be some deduction made on behalf of Scotland and Ireland, where a considerable quantity of oatmeal, potatoes, and Indian corn was consumed. Deducting two and a-half million quarters on this consideration, would leave about twenty million quarters of wheat and flour as the consumption of the United Kingdom. Now, he would show what was the quantity of wheat returned in England to meet this consumption. The figures he was quoting were quite authentic. His theory might be wrong, but his figures were right. In six years the returns from 290 towns were as follow: In 1856, 4,046,000 qrs.; in 1857, 5,243,000 qrs.; in 1858, 5,203,000 qrs.; in 1859, 5,498,000 qrs., which was the highest return in the period; in 1860, 4,623,000 qrs.; and in 1861, 3,578,000 qrs. Now, as they had to make up twenty million quarters to meet the consumption, there was a vast difference somewhere; but, of course, they had to take into account the importations that had taken place from abroad. These had ranged from five million up to ten million quarters of wheat and flour a-year. In the first three years, five millions, in round numbers, were annually imported; but in the latter three years, about ten millions—showing the great deficiency there was in the yield of this country for the last three bad seasons. They must also add the wheat grown in Scotland and Ireland, which did not come into these returns. It was difficult to get a correct estimate for Scotland during the last few years, because the able statistics which were obtained by the Highland Society, through Mr. Maxwell were taken out of his hands in 1857, and no returns had been made since. Up to that time, the annual growth was about 750,000 qrs. In Ireland the growth was about 1,600,000 quarters a-year, or considerably less for the last two or three years, as they had had bad seasons in that country as well as in England. Say Scotland and Ireland produced 2,300,000 quarters; this must be added to the quantity imported, which was five millions for the first three years of the period named, and ten millions since. Now, even taking ten millions (the most imported), with 2,300,000 for Scotland and Ireland, and three and a-half millions returned in England and Wales, there were over four million quarters not accounted for, so that it was right to assume that not one-half of the wheat grown in this country was returned at all. In passing, he would say a few words about barley. Now, he believed that the quantity grown in this country was nearly equal to wheat, being greater in proportion than any other country in the world. In France they grew five times more wheat than barley, but we a much greater proportion of barley to wheat. But, notwithstanding this, only a very small portion was returned, and that the very best; so that they paid their tithes on the best barley, the bad not being returned at all. Such men as Mr. Bass and other great brewers did no doubt make returns; but the large quantities consumed on their own farms, and by the small millers and maltsters in the rural districts, were scarcely ever returned. Now, they knew that about five million quarters of English barley were malted annually;

and he believed the quantity grown besides was from four to five millions more. And what was the only criterion of the price which this barley fetched in the market? It was these corn returns. The quantity, however, returned as sold in England and Wales in 1856 was 2,800,000 quarters, instead of eight or nine millions; 1857, 2,200,000; in 1858, 2,400,000; in 1859, 2,400,000; in 1860, 1,778,000; and in 1861, 1,851,000, or about a quarter of what was actually grown in the country. He himself intended to have spoken upon this point when the malt-tax deputation waited upon the Chancellor of the Exchequer, for Mr. Gladstone stated that, notwithstanding the duty, barley had maintained a high price in this country; and he should have shown him, if there had been an opportunity, that the figures he quoted were very erroneous, because they were taken from these returns, which did not include one-fourth of what was grown in the country, and that, as a rule, the best. He did not think it was fair of the Chancellor of the Exchequer to draw his conclusions from such erroneous data. He did not pretend to say that false returns were made (and he wished to mark this distinction), because there was no object for doing so, although there might have been when there was a fluctuating scale of duties. He believed the errors arose more from carelessness in carrying out the law than anything else, and the omission of the inferior qualities of corn from the returns. In the first place, all that was consumed at home on the farm was never returned. Even under a new law he did not see how this could be remedied, except, as had been suggested at a previous meeting, they sold it all; but this was more a question for the producer than the Legislature. He would also observe that respectable men were generally appointed in the towns to receive the returns; but no one had any authority or control over them. They made the returns as they liked, and, however well-intentioned, they knew that men were liable to err under such circumstances. In a neighbouring town he knew an instance in which an inspector made a mistake of 10s. per quarter on all the wheat sold on a particular market day; and when they considered that the three market towns in this neighbourhood ruled various transactions, not only tithes and sometimes rent, but also the valuation of crops between an in-coming and an out-going tenant, they would perceive that the 10s. would have materially affected the whole average of the district. He therefore thought it was highly necessary that some less loose method should be adopted in such an important matter as this. Here they had one of the most expensive governments in the world, by which the interests of all were supposed to be looked after, and after paying so dear for their whistle it was certainly wrong that such a state of things should be allowed to exist. He had received a note from one of the county magistrates, stating that he understood he (Mr. Darnley) was going to bring this subject before the club, and enclosing a letter received from one of their members. It appeared that the gentleman had, years ago, called the attention of the hon. member to the deficiency of these returns; and he received a very kind note, acknowledging that it was very bad indeed, and stating that he would take the earliest opportunity of bringing it before the notice of one of the members of the Government, in order to see if something could be done. That was thirteen years ago, but nothing had been done; and it was so long since that he had little doubt the hon. gentleman had forgotten that he ever wrote such a letter. Thus they might go on for another thirteen years; and the probability was that the matter would remain just where it was at present. In order to remedy the evil, it had been suggested by this club that the corn inspectors should receive the returns as now, but that they should be subject to some supervision; that there should be a small board in each town, composed of two, three, or four disinterested persons, to examine the returns with the inspectors once a week; that they should look after all parties in the habit of buying corn in the different market towns; and, if they did not make returns, call upon them to do so, or enforce the penalty if necessary, which would be an improvement, for it was only from carelessness that they were neglected. In many towns, however, where large markets had grown up, no returns at all were made, while they were required in such places as Poole, where scarcely a bushel of wheat was sold during the year. A gentleman had told him that in Essex there were only four market

towns which made any returns at all. The last time they considered this question they merely suggested that this board should be formed, and that those composing it should be moderately paid for their labour. But this appeared no longer sufficient to meet the case. The evil had grown so great that some other remedy was necessary; and he could not help thinking that the sellers should make the returns as well as the buyers. He knew the sellers might object, on the ground that it would give them considerable trouble; but they knew that the fear of a little trouble was the bugbear to any improvement. He thought it was worth their while to take upon themselves this little extra trouble, and endeavour to instil into the minds of their representatives the enormity of the present returns. He believed any gentleman willing to serve the agricultural body would gladly take up a question of this kind. It was not a question in which party politics was concerned. It was a question in which all concerned. It was a question in which landowner, occupier, and the general public were interested. All they wanted was to get fair returns, which would show what was the true state of the market, what they did actually grow, and what progress they made. But in England all these things were neglected. He did not say that they should go to the trouble of petitioning Parliament, or anything of that kind, but he thought they might induce some gentleman interested in the subject to use his efforts for the remedying of this monstrous evil, for he could call it nothing else, seeing that it was really unfair to the people of this country.

Mr. SAUNDERS thought it ought to be compulsory for the person who sold corn to make returns as well as those who purchased, and that what they sold at home for grist or feeding ought to be taken into consideration, when rent, tithes, &c., would be governed by what they really grew, instead of upon the best sample only. He also thought it very unfair that a man who occupied a poor farm in an unkindly climate should have to pay upon the best samples which were produced inland.

Mr. RANDALL believed that, next to the malt-tax, this was a matter of the greatest importance to the farmer. When the alteration was made with respect to the tithe commutation, he thought that Government ought to have taken steps to secure the averages being obtained in a more correct manner. It was well known by everyone who attended a market that scarcely one-third of what was sold was returned. If a dealer was asked about it, he said if he did not return in the market in question he did in some other, when he made up his return at the end of the week; but he contended that all corn ought to be returned in the market where it was purchased. He thought that, to obtain fair averages, it was highly necessary that the farmer should make a return of the corn he sold, as well as the merchant of what he bought. Perhaps there might be an objection to the farmer making a return; but he could not see how it could be maintained, as it would only be a check upon the returns now made. Sometimes when the price of corn was low, and in some localities they could not grow as good qualities as in others, they did not find the returns in accordance with the sales. Whether wrong or right he could not say, but he had thought whether there might not be an objection on the part of millers to return these low prices, as the baker intending to purchase might make his calculations accordingly. He did not say it was a fact, but still such a practice might prevail in some cases. He hoped that some move would be made in the matter, as it was one of serious consequence to corn-growers generally.

The CHAIRMAN said there could not be two opinions upon this part of the question—that the present machinery for getting at the averages had entirely failed. It did nothing of the sort; and it appeared, from the figures quoted by Mr. R. Darnley, which were no doubt correct, that scarcely one-half of the wheat sold in the market was ever returned, and only about one-third of the barley malted in this country. Now, this was a state of things which ought not to exist, especially when their greatest payments, such as tithes, and sometimes rents, were based upon these returns. He quite agreed with Mr. Randall that, not only the corn bought and sold ought to be returned, but the whole produce of the farm, as it was evidently the intention of the Act that the payments should be based on the actual value of the whole. As to barley, it was a fact that more than three-fourths grown in the western counties, except in a few more favoured localities, was used for feeding cattle, &c., and never came into the returns

at all. He therefore considered that some means should be taken to get proper and fair returns. It was not for them to suggest the remedy. All they had to do was to show how much they were aggrieved and imposed upon by the present law, when Parliament certainly ought to inquire into the subject. If, however, referred to them, there could be scarcely any difficulty in proposing a better plan than the present.

Mr. SLV said he always tried to return all he bought, but then they were only the best samples; but he ground a great deal of inferior wheat and barley for farmers, which was not returned at all. He therefore thought the seller ought to make a return, including his inferior samples, which would make a great difference in the average.

Mr. KHADEN considered it essential that some alteration should be made, because it was proved that the returns were very erroneous; and if the Government wanted to know what was grown in the country, they could only get at it by requiring the seller to make a return as well as the buyer. Perhaps it might be some benefit to know what quantity of corn was grown from year to year, whether it was increasing or decreasing, and then the farmer would have to make a return of all grown, whether consumed or sold. He thought there ought to have been some alteration many years ago, for it was said that if they took money out of a man's pocket he recollected it for a long time. On entering upon his farm he took the crops at a valuation, governed by the returns in the market for the months of October and November. They had a very bad time for saving their barley; and he had to pay upon the returns at 40s. a quarter, while he would candidly say that he never made 28s. a quarter of it, not a bit of which was returned, and consequently some hundreds of pounds were taken out of his pocket. The fact was that these returns not only governed tithes and rent, but the transactions between the in-coming and the out-going tenant; and this was a matter of the greatest importance. He did not believe that anyone would wish to get the returns higher or lower than they really ought to be. What they wanted was a fair and

honest return both for wheat and barley. As to oats, he thought it would be difficult to arrive at a satisfactory result, because four-fifths of what was grown in the country was consumed on the farm. The question was how they would proceed in order to obtain a remedy. Would they get up a petition, or lay a statement before the county members, so that they might be able to bring the subject before Parliament? It was no use speaking of it here, and then letting it drop.

The CHAIRMAN said he had a great deal of pleasure in proposing a vote of thanks to Mr. Robert Damsen, for the able manner in which he had brought the subject forward; and he perfectly agreed with the suggestion thrown out by Mr. Reader that some steps should be taken to press the matter upon the attention of the House of Commons. Petitions were of very little use; and the better plan would be to lay their views before the county members, who might avail themselves of an opportunity to make their voice heard for the purpose of remedying the evils of the present system.

Mr. SAUNDERS seconded the vote of thanks, and further proposed that a statement should be prepared, drawing the attention of their members to the subject, and asking them to assist in getting the returns properly taken.

Mr. DAMSEN returned thanks, and said it was exceedingly gratifying to find that their views so entirely coincided with his own. He fully agreed with the remarks that had fallen from Mr. Reader and the Chairman respecting some movement being made in the matter. He would also suggest that, as there were several farmers' clubs in the county, which may be said to represent the feelings of the county at large, it would be very desirable if they would act in concert in bringing the question before the attention of their members. He thought all the clubs were unanimous on this question. The fuel was laid, and it was only necessary to put a match to it; and if they jointly brought their grievances before the county members, they would doubtless do something to obtain a remedy.

LORD NAAS ON AGRICULTURAL SCIENCE AND THE USE OF MACHINERY.

At the dinner of the Cumberland and Westmoreland Agricultural Society, at Cockermouth, Lord Naas, M.P., occupied the chair, and spoke as follows:—

Mr. Vice-Chairman and gentlemen, I have now to propose for your acceptance the toast of to-day. I have to ask you to drink "Prosperity to the Cumberland and Westmoreland Agricultural Society" (applause). Gentlemen, I believe that the improvement in the state of agriculture in England—in the United Kingdom, I may say—which has taken place during the last half-century, is, in some extent, to be traced to exertions of societies such as this. They have existed now for a great number of years, and, as years have rolled on, have become better known and more felt, and now command, I may say, the sympathy and support of all persons connected with agriculture throughout the country (loud applause). Landlords and tenants combine in their support of these associations, vie with each other in competition for every prize offered, and give their best assistance in diffusing the knowledge which is calculated to advance that noble pursuit on which, I believe, the prosperity of this country in a great measure rests (Hear, hear, and loud applause). It is the custom of Englishmen to combine for all sorts of purposes. There are no persons who appreciate so much as Englishmen the value of associations. We therefore find associations in this country and the colonies established for every possible purpose; and, generally, such association is attended with success (applause). Englishmen, in this respect, remind me of the old fable of the fagot of sticks—singlehanded, the ablest and strongest amongst us is comparatively weak, but associated with others in such a pursuit as we are engaged in to-day he is invincible (applause). As Sir Charles Coldstream remarks in the play—"Englishmen, if they want to do anything, meet, elect a chairman and secretary, appoint

a committee, pass a few resolutions, and the thing is done" (applause). The agricultural bodies appreciate this principle, and act on it. One effect of these institutions has been to alter considerably the opinions held by the public at large of the agricultural body. I know some few years ago it was quite customary for a certain body of men in this country to state in public that the farmers were entirely an unprogressive class of men; but now we seldom or never hear these opinions advanced, and the farmers get as much credit with the public generally for advancement and progress as any other class of men in the country (Hear, hear). We have heard it often stated in olden times that farmers were men who rarely associated with each other, who had no care or interest in anything beyond their doors, whose only thoughts were upon their farm-yards, who hated change and opposed improvement, who were very superstitious, who believed in witches, and nailed horseshoes over their doors for luck (laughter). Now, I am glad to say, we never hear such rubbish uttered; and the agricultural classes generally now command as much as any other the general respect of the community (applause). There are great difficulties in the advancement of agriculture. Men devoted to an agricultural life have not, to a certain extent, the same advantages, as are possessed by people living in the towns. They have not the same facilities for meeting and talking over their own affairs as the urban population have. It is, perhaps, for this reason, that enlightenment does not proceed quite so swiftly amongst agriculturists as it does amongst many other industrial pursuits. But, gentlemen, the farmer has to contend with great difficulties which those embarked in other industrial pursuits know not. He has not only to consider, with the manufacturer, the proper and most advantageous way of laying out his capital, but he has also to take into account the

chances of the weather, the changes of the seasons, the varieties of soil, and the health and suitableness of his cattle. It is, in effect, the most uncertain pursuit in which a man can be engaged. Notwithstanding all these disadvantages, there is so much that is noble and in conformity with the best and worthiest feelings of our nature in the pursuit of agriculture—notwithstanding all these disadvantages, I say modern practice has rendered it the most popular employment in which we can engage, one most gratifying to the feelings of every man who wishes to live at home in peace and do his duty to his neighbour and his God (loud applause). The advancement of agricultural science in Great Britain has been principally confined to the last and present generation. If our grandfathers were to rise from their graves they could hardly believe what had become of the past-century system of farming. You may farm as you like, but there will be nine failures out of your ten attempts if you have not recourse to a thorough system of drainage. A thorough drain was unknown to our farmers of the last century. The use of artificial manure is also of a recent date, and the fine old English gentleman would have looked on anyone as an impostor who would have told him that soon after his death one of the most important manures applied to the soil of our country would be carried 15,000 miles over the sea to enrich our soil (Hear, hear). Within the last century the three great essentials of agriculture—draining, deep ploughing, and the employment of artificial manure—have been discovered, and if these three great essentials are practised with care, there is no doubt of the result. We have seen, within the last century that a new breed has been created—a breed, I may say, without fear of contradiction, second to none in the kingdom—I allude to the Shorthorned breed (applause). In the great qualities of size, early maturity, and tendency to fatten, it stands unrivalled. We must recollect that the short-horned breed is entirely a new breed. It was only created by our grandfathers, and it has now taken a place as one of the first, certainly the most profitable, breeds of cattle in the universe. It came from the north. The county of Durham gave its name to the breed; and it has been adopted in every part of the country, in Scotland, Ireland, and, indeed, in all parts of the land. If a great number of this new breed have been spread over the country, and eagerly propagated by the breeders, there has also been during the same time a proportionate improvement in the old and distinct breeds of the country. The Herefords have improved, till they are now great masses of muscle, flesh, and fat. The symmetry and beauty of the Devon is much enhanced, while the milk-giving propensities of the Ayrshires and Alderneys have been vastly increased: even the West Highlanders have not escaped the general contagion, and at the Breadalbane sale the other day a yearling heifers of this breed actually sold for 45 guineas a piece. Of these we had a good show to-day. Then, with regard to pigs, what shall I say of them? (laughter). Most of you will remember thirty years ago, when the very same of perfection in pig-breeding showed nothing but meat and legs (laughter), but in the modern pigs these features are kept entirely out of sight (Hear, hear). Well then, gentlemen, it must have taken a considerable amount of experience to have brought these different kinds of stock to such great perfection. In sheep our breeders are endeavouring, with great success, to add to the size, without diminishing the symmetry of the beautiful Leicester and Southdown. One good breed is often ruined by indiscriminate crossing. It seems to me that a great many people imagine they have nothing more to do than to cross often enough, and indiscriminately, and they will get the breeds they want perfectly. A successful cross is the exception—a failure the rule. Breeders of experience well know how a herd, a flock, a stud, or even a pack of hounds may be nearly ruined by one injudicious or unsuccessful cross. The difficulties are enormous, therefore is success all the more appreciated when it comes. But great as has been the advance made in the first requisites for successful tillage and in the breeding of stock, the application of machinery to agriculture has within the last few years made even more rapid strides. It will hardly be believed how in a few years this essential element of successful husbandry has progressed. There was nothing farmers were so much prejudiced about as this. Thirty years ago the farmer thought no other implement was necessary for the cultivation of his land than the common plough. It is now found that machines have been invented to perform

nearly every kind of farm work; and they do their duty most efficiently, and command a ready sale throughout the kingdom. I was much struck in perusing a few remarks in an agricultural paper on this subject. Speaking of the Royal Agricultural Society's show at Worcester, the *Mark Lane Express* of August 8, 1863, says: "There was no feature in the late show of the Royal Agricultural Society at Worcester more striking than the enormous increase in the quantity and variety of machinery exhibited. On a comparison of the catalogue with those of former years, we find that whilst in 1860 at Canterbury, there were 3,947 articles entered, the number has risen in 1863 to 8,830, or an addition of nearly half the former number. And the number of stands has likewise been augmented from 212 in the former to 340 in the latter year, being more than half as many more. And if we were to go back still further, we should find a much greater difference. The report of the jury appointed to decide on the merits of the agricultural machinery in the International Exhibition of last year, affords some striking facts on this head, indicative of the great progress made in the employment of machinery since 1851. Thus, in 1852, six firms turned out 270 steam engines for agricultural purposes; and in 1861 the same firms sold 898, which was an increase of 330 per cent. In 1861 two firms, that had no standing as plough-makers in 1852, sent out 9,309 ploughs. Four firms that had no existence in 1851 as makers of cultivators, made and sold 1,199 of these implements in 1861. Three firms, who manufactured 333 corn-drills in 1852, raised the number in 1861 to 703. Four firms, who in 1853 sold only 32 reaping machines, in 1861 sold 1,715. In 1853 six firms sent out 327 threshing machines; in 1861 they sold 1,084. The horse-rakes rose in the same period, from 611 to 1,739, from five firms; the haymakers of two firms, from 50 to 721; the chaff-cutters by three firms, from 1,004 in 1855, to 4,805 in 1861; and five firms which in 1852 turned out 64 corn-bruises, increased the number in 1861 to 2,680." &c. You will observe, gentlemen, from this interesting report that all this advance in agricultural machinery has taken place within the last ten years. This has all been done within that period. All these implements have been manufactured, sold to purchasers, and used on the farms throughout England during that time (applause). It was thought very generally that the application of machinery would do away with a great deal of manual labour; but, instead of that, it has ever been found where machines are introduced that the number of labourers is not diminished (Hear). There is now as great a number of people employed in agricultural pursuits as at any other period of our history (loud applause). No, gentlemen, the labourers have nothing to fear from the improvement and introduction of machinery; and this always renders necessary an increased expenditure of capital, the result of which is that production is augmented, and a greater number of persons are required in consequence (applause). This has been found to be the case in other industrial pursuits, and the same rule holds good as applied to agriculture. I say again, the labourer has nothing to fear from the introduction of machinery. Never since machinery was applied has it had the effect the labourers dread; the only difference which the labourer will find will be, that the labour in which he is engaged is not quite so severe as under the old system (applause). I admit that in some few cases individuals may suffer, but the great bulk of the working class will reap immediate and permanent benefit from any process that augments the prosperity of the particular industry in which they are engaged. Talking of the effect of the introduction of machinery, and the effect it is likely to have on the agricultural labouring classes of this country, there is another matter affecting them worthy of our attention and serious consideration. I am glad to see that the great question of the improvement of the dwellings of the labouring classes is being brought prominently before the public (applause). I entirely agree with the remarks made by Mr. Howard and Mr. Marshall on this most important subject. Any one who reads or thinks on this matter cannot fail to appreciate its vast importance. It is one of the great questions of the day; and although the general tone of feeling seems to be in the way of improvement, still I believe that in many quarters it is not sufficiently entertained. A good deal has been done, but there are still people living in dwellings where the characteristics of comfort, cleanliness, and decency are very much wanting, if not totally disregarded. Men, women, and chil-

den cannot live in close confined houses, with insufficient accommodation, with little light, air, or water, without destruction to health, and, what is worse, a great danger to morality (applause). On the very lowest possible ground—that of economy—there is much to be said in favour of the improvement and extension of these buildings. Your labourer is the most valuable and the most delicate machine on your farm. His weakness is your loss, his strength is your gain (Hear, hear). You will find, even in a money point of view, that you will get much more valuable work out of your labourer if he is well cared and provided for—well lodged and clothed, comfortable, contented, and happy. You ought to put him in a position to render his irksome life as easy as possible, that he and you may work for your mutual interests, and feel no inclination to part (applause). Therefore, gentlemen, even on the lowest possible ground of profit, you must see it to be your interest to improve the dwellings of the agricultural labourers; but when you come to the higher view—when you think that this man is of the same flesh and blood as yourselves, and actuated by the same feelings, with the same hopes, fears, and desires; that he is, like us, in his own way playing his part in the great struggle of life, and is, I hope, wending his way also like us to that distant land where all are equal—then it behoves us to consider how what at first appeared a matter of economy and money, becomes a matter of duty—a duty of the very highest order (applause). I believe that those engaged in agricultural pursuits only require this great defect to be pointed out to them; and that all

classes will at once willingly and heartily combine together to remedy the dwelling of the agricultural labourer (loud applause). The present year is a most opportune one for the consideration of this question. We know that in the south a most abundant harvest has been collected. Here in the north, with a climate not so favoured, the harvest is not yet gathered in; but we hope, by the blessing of God, to have as great and bountiful a harvest as those in the south have gathered (applause.) Any surplus arising from a plentiful harvest could not, I am certain, be better bestowed than in improving the dwelling of the labourer. In doing so we shall not only be benefiting ourselves and alleviating his hard lot, but we shall be obeying the commands of Him who has told us in our prosperity to remember the needy and to help the poor (applause). I merely throw out these remarks that you may think over them when you go home. I do not in the least degree want to say anything which you may imagine to be like preaching a sermon (a laugh). I merely wish to bring before you an interesting and important subject. Judge my remarks as you think best; if you think them at all worthy of your consideration, adopt my suggestions (applause). I believe that societies such as this give the best opportunity that can be offered for expressing our opinion, knowing each other, and discussing matters such as those to which I have briefly alluded; and, therefore, on that account, as well as many others, I call upon you to drink, with all the enthusiasm you are capable, "Success and Prosperity to the Cumberland and Westmoreland Agricultural Society" (great applause).

THORNEY HARVEST FESTIVAL.

On Sept. 15 the tenantry of His Grace the Duke of Bedford on the Thorney Estate gave their united harvest festival. The first festival, which was held two years ago, was considered a great success by all parties. The labourers, into whose minds many doubts had crept as to the amount of enjoyment they should receive by this new mode of celebrating the harvest home, in excess of the *old way*, were agreeably surprised, and expressed in unmistakable terms their appreciation of the scheme, which appeals at once to their intellectual and moral capacities, to the prejudice of mere animal enjoyments, which afforded a day's relaxation instead of a night of drunken riot, when near 700 men partook of a substantial dinner, provided and waited upon by their employers. Dinner over, the majority quickly found their way to the race-course to witness the pony and donkey races, flat and hurdle, with other amusements; some retired to the smoking tent, to enjoy their tobacco and quart of ale, until tea, at which they were joined by their wives and more than a thousand visitors, who took tea at tables provided, decorated, and presided over by the ladies of the parish. Any amount of praise could not be esteemed flattery lavished on the Ladies' Committee, who so ably and skillfully carried out that part of the programme. The tents at tea were an imposing sight, such an one as will long remain impressed on the mind of those visitors who on Tuesday first attended the Thorney Harvest Festival. The farmers, too, were somewhat diffident as to whether they should co-operate with their worthy pastor at that time, doubting his zeal and abilities to carry out the project, were not less gratified. Encouraged by former success, and the expressed desire of many of both classes, W. Whetling, Esq., and Rev. J. Cantley convened a meeting of the tenantry, at which committees were formed to take the management of an United Harvest Festival. To say the tenantry were unanimous would be wrong; a small minority here, as elsewhere, ever ready to clog the wheels of the car of intellectual progress, complied, though perchance with an ill-grace, to an overwhelming majority, who wished to improve the condition of their labourers, who desire to create a better feeling between the employer and the employed. The day was kept as a close holiday. The village was completely *en fete*. From early morn this neat and quiet little town presented a most lively appearance; all were busily engaged; everything seemed to indicate to a stranger that something

unusual was to take place that day. In a field, about a quarter of a mile off, might be seen several large tents, two of which were capable of seating 1,800 or 2,000 persons, decorated with flags and evergreens, and designs in flowery corn and sickles. Arrangements for dinner were made. Shortly before 11 a.m. waggons tastefully decorated loaded with labourers began to arrive. Proceedings commenced at 11 o'clock with an appropriate service and sermon, preached by the Rev. Daymond, in the Abbey, from 65th Psalm, v. 11, "Thou crownest the year with thy goodness; and thy paths drop fatness." From the Abbey a procession formed, and, headed by the band, repaired to the tents. After a concert by the Abbey choir, Mr. Mein, the Duke of Bedford's steward, rose, and asked for three cheers for our "Queen," and the "Prince of Wales," which were right loyally responded to. Then followed the "Visitors," the "Farmers," and then, on which he layed particular emphasis, the "Labourers," and "long may we live to have such reunions as we have had this day." Each in succession was *lustily cheered*. The Rev. Mr. Cantley, in the name of the committee, thanked the company for their attendance, and the labourers for the orderly manner in which they had conducted themselves. He contrasted this with the old way of giving harvest suppers. After enumerating the advantages derived by thus appealing to the moral and intellectual faculties of the men rather than their mere animal propensities, to the farmers, he said, this was the way to cause a better feeling between them and their men. It was a mistake to say that the labourer would not appreciate this; those happy faces that he saw around him were ample evidence of the truth of that assertion. He urged them to bear in mind that good masters make good servants, and that thus uniting with them and giving them to understand that he cared for their welfare and enjoyment, was the best way of cementing that good feeling that should exist. Nothing tended more than those social gatherings to do all that was required in that respect, prevent those irregularities and excesses, that had been urged in some parts as a serious drawback to affairs of this kind. He thanked the labourers for the orderly manner in which they had conducted themselves; he hoped they would continue with the same propriety to the end of the festivities, then return to their homes, happy and grateful, not only to their employers for the good things they had provided, but thankful to their God for the many blessings he had cou-

ferred, and the bountiful harvest, the safe in-gathering of which they had that day been celebrating (Hear, hear). He could not retire without expressing his sincere thanks to one without whose assistance we could not have met here this evening (Hear, hear). Although not one of the committee, he worked with them. Had he not rendered the material assistance he did, this festival could not have taken place. That gentleman was Mr. Meir, than whom they had not a more able assistant or sincere friend (cheers).

Mr. MEIR said this was a gathering that afforded him great pleasure, as he knew it must everyone present who wished well to the farm-labourer. He could not speak too highly of it. It was the proper way of celebrating the harvest-home. Nothing tended more than those social gatherings to improve the feeling between master and man. His reverend friend had said a great deal about the way in which he had assisted. Now, so far as he was concerned, they were very welcome to his services, for he was only too happy to contribute whatever lay in his power to what, in his estimation, was the proper way of giving thanks to an Almighty God for the successful completion of a luxuriant harvest (cheers). To the labourers he wished to say just a word. At the conclusion of a former festival he was through the village at a late hour, and did not observe one intoxicated person.

Now he hoped to be able to say the same after this evening. He thanked them for the attention they had given, and should ask his friends to give three cheers—three such hearty cheers as he would lead them with—for the labourers; aye, and one more cheer for their “bonny bairns.”

During the hearty response which this met with the speaker took his seat. Three cheers were then given for Mr. Meir, and the company retired to witness a display of fireworks. Those over, led by the band, the company, who were estimated at more than 3,000, made their way to the village. The road was illustrated by Chinese lanterns hung among the branches of the stately elms, which meet over the centre of this favourite walk. Of the appearance but one opinion was heard; everyone was delighted with the garb it had assumed for the evening.

The band performed the national anthem on the green, which concluded the pleasures of a day that will long be remembered by the inhabitants of Thorney, and worthy of imitation by all who desire morally and intellectually to improve the condition of the labourer, and in a rational manner return thanks to the Great Giver of all Good for the successful in-gathering of the harvest.

AGRICOLA.

Sept. 17, 1863.

A HARVEST HOME IN THE MIDLANDS.

A harvest-home in a well-ordered English parish is one of the most pleasing sights to be found in England at the present day. At Thurlaston, Leicestershire, on Sept. 17, took place one of these annual festivals, the arrangements being principally made by the Rev. G. E. Bruxner, the rector. The beautiful and picturesque church was decorated with ripened grain and corn-flowers. The front, the capitals of the columns from which spring the chancel arches, and other parts of the church, were wreathed with fine ears of oats and barley, intermingled most beautifully with geraniums and other brilliant-hued flowers. Near the communion-table was a large stand holding fine sheaves of wheat, oats, and barley, and a beautiful design worked with corn-ears. The proceedings of the day commenced with a procession, consisting of the rector, many of the surrounding gentry, farmers, and the whole of the labourers—all decorated with ears of corn. Banners, and a large quantity of corn, were also carried and deposited in the church. The service included some of the prayers from the form agreed on by Convocation, and included the hymn—

“Lord of the harvest, once again
We thank thee for the ripened grain.”

This part of the proceedings over, the men were entertained with a capital dinner, and the women with tea: then rustic sports were engaged in, and the day closed with a dance on the green. The hon. Capt. Moreton, Hon. and Rev. A. Byron, and A. Arkwright, Esq., were amongst the visitors. A very similar festival took place on the same day at Shenton, at which there were Major Wollaston and Sir Alexander Arbuthnot. The feeling which pervades these gatherings will be seen from the speech of Major Wollaston in proposing “The Employers.” He said:—“Your masters, my friends, have drunk your health with great cordiality, and it now becomes your turn to pay them the same respect that they have paid to you. Such kindly feeling creates a lasting link between employers and employed, and as your mouthpiece, I must say that I am sure it is your wish to cultivate this kindly feeling, which has existed here from time immemorial. You know that one cannot exist without the assistance of the other, and that it is as much to your welfare to be scrupulous in having regard to your master's interests, as it is their wish that you should have your

just due. There always is, as you know, an old saying, that a fair day's work is entitled to a fair day's wage, and a fair day's wage is in the same ratio fully entitled to an honest day's work. This mutual confidence between master and man makes the machine run smoothly and agreeably to all parties concerned, and I know that I can proclaim that it is your wish that this kindly feeling should continue to exist, and that upon the strength of this you request all here present to lend their voices in drinking to the “Health of the employers of labour,” and with this toast to couple the name of your good friend Mr. Thorpe.

In the adjoining counties of Northamptonshire and Warwickshire similar gatherings now obtain. At Little Houghton the service proved more than usually attractive. Madame Goldschmidt (Jenny Lind) was one of the visitors, and the distinguished cantatrice, with her usual kindness of heart, advanced to the organ and sang a harvest hymn.

LANDLORD AND TENANT.—The following address has been issued to his tenantry by the Right Hon. the Earl of Shannon:—“I am induced to make a few remarks on the probable future prospect of farmers in Ireland, thinking that they may be acceptable to some of the tenants on my estates. Probably many consider themselves better qualified to instruct me, and perhaps they may be so. No harm, however, can result from the expression of my opinion. It is now evident that free trade in corn, with increased facilities of shipping for freight thereof, will prevent, for the future, high prices of corn, more particularly of wheat. Our climate, also, will not allow of wheat being grown to compete with foreign corn. It is clear, therefore, that the farmers who go on with the old system, of potatoes followed by wheat, cannot prosper. If high prices should prevail, they can only be the results of bad harvests. Good harvests will ensure low prices. It was lately observed to me by a most intelligent English farmer, who farms most extensively, that henceforth it would be cheap bread and dear meat. Everything supports this view. I am satisfied that henceforth, however he may go on with cropping, the main reliance of the Irish farmer must be live stock in some shape. Live stock and meat in every shape will never, I believe, be introduced in sufficient quantities to affect materially the prices of such produce at home. The meat and butter consumption is annually so much on the increase in England, and even, I am assured, in our own country, that

the demand now almost exceeds the supply. Witness, in the face of the distress in the manufacturing districts, the market prices of beef and mutton, and high prices of store stock at all the present fairs. I wish it not to be supposed that I am advocating a general laying down to grass of the land. While I believe, and am satisfied by personal experience, that land pays better in grass than in any way, when perfectly suited to it, I am aware that in a very large portion of the country mixed farming, I mean both crops and stock, will be most remunerative. On inferior lands a larger amount of stock can be carried by judicious growth of roots and summer feeding than, were the land in pasture, could be supported. But where the land is to be in crop, I say, let stock, and the support thereof by artificial food, be the object for profit, and not the corn crop—that must be looked upon as an auxiliary, not as the sheet anchor. Whatever large farmers may look to, or dairy, it is to the small farmers that I especially address myself. I have often looked at the small holding of Belgian farmers, wishing that our cottier tenants could be induced to follow their example. There the small occupier trusts mainly to his spade. He would look on the consumption of a horse as so much dead loss to him, and so it would be. His cows are kept in a house by night and by day in winter, converting his straw into manure, and filling his tank with ample liquid manure, wherewith his clover is dressed in summer. In summer the cows are either fed in houses on clover grass, or if out are tethered carefully. He would look with horror on the loss of land by the useless and unsightly banks which cover so large a portion of our land. Why will not our small farmers, at least, try a system whereby these Belgians are in such com-

fort? I say to them—discard your useless, starved horses; dig your land well, and remove fences, save perhaps the boundary of your farm; keep your cows in house, and consume your roots and straw for the stock; do not carry them, as now, to market, to the certain ruin of the land, and consequently of yourselves. You will find the return from the dairy and rearing of calves a very far more certain one than relying now on the two most precarious crops known—wheat and potatoes. You will find also, more especially on the rough portions of our land, a furze meadow to be an invaluable aid to the stock, in conjunction with the roots. Probably, also, on small farms, where the labour of the family is available, flax may be grown to profit in small quantities. But whatever you do, I entreat you, as a friend who takes a deep interest in your well-being, to look around you, and observe the signs and progress of the day. It is my firm conviction that the value of land and profits to farmers will as certainly increase in this country as they are doing in England; but every farmer must adapt himself to the changes of his times, if he wishes to prosper. I believe most firmly that if the small farmers persist in relying, as hitherto, on the faithless crops of wheat and potatoes, ruin will rapidly overtake them, and that they will soon be extinct as a class. I have penned these few ideas, hoping that they may be of use to some. It is, indeed, grievous to see Ireland alone, not only not progressing, but retrograding. Rely on it, that although there may have been latterly bad harvests, they alone are not the cause of our position; it is the fault of our obstinate perseverance in a bad system, and it will be seen, if the same course is persisted in, that good harvests, when they may come, will not restore prosperity."

IMPORTANT SEED CASE.

A record case of considerable interest was tried recently at the Kildare Assizes, before the Right Hon. the Lord Chief Baron. It was an action instituted by Mr. Goff, a shopkeeper of Newbridge, Co. Kildare, against Mr. Berry, the well known and respected seedsman, of Arran-quay, Dublin, for the purpose of recovering the sum of £211 7s. 6d., as loss and damage sustained by the purchase of certain bad seeds.

It appears that Mr. Goff, or rather the firm of Johnston and Goff, who are general merchants, and keep a grocery as well as a seed shop, had been for some years in the habit of procuring seeds from Mr. Berry, for the purpose of vending those seeds in retail to their customers around Newbridge. No cause for complaint appears to have occurred in all the transactions between the parties until last year, when Mr. Goff purchased for his retail trade 1 cwt. of Skirving's swede turnip seed and $\frac{1}{2}$ cwt. of green-top Aberdeen, and at a subsequent period $\frac{1}{2}$ bushel of purple-top swede, and it was out of the last of these purchases that the late action arose.

The plaintiff stated that, previous to receiving his purchases from Mr. Berry, he had old Aberdeen seeds in his shop, which were properly labelled, and also "between 7 and 10 lbs. of rape seed, which was kept on the grocery side of the establishment," and of which 3 lbs. were left. Several parties who had procured turnip seeds from Mr. Goff complained that, while some of the seed purchased from him proved to be turnips, and true to the name under which the seed was procured, there was a large intermixture of what the witnesses for the plaintiff designated as "most curious kinds of plants," "wild rape," "weeds," "wild plants," "something like rape," "the most strange crop ever a man saw." Several of the parties who purchased the seed had obtained decrees against Mr. Goff at the Maynooth Quarter Sessions.

On complaint being made to Mr. Berry by Messrs. Johnston and Goff, the former sent a person to examine the crops, and it appears that Mr. Berry subsequently went to make a personal inspection. It also appears that some arrangement for compensation had been made, at least with some of the parties; for Mr. Edward Flood stated in the course of his examination that Mr. Dowling, Mr. Berry's representative, and Mr. Goff called on him to view the crops, and each of them asked him to make an arrangement for the loss he had sustained. Mr. Flood agreed that two parties should frame a deed of agreement, which he would sign; he afterwards went

to Newbridge for that purpose, and admitted the deed of settlement, and signed the agreement.

It was proved for the defence that Mr. Berry's warehouseman had made up Mr. Goff's order from the contents of sacks received from England, where the seed had been originally purchased by Mr. Berry, and that the sacks had been untouched until he opened them to make up Mr. Goff's order; that seeds of the same kind had been sold to others, retailers, &c., who had no complaints to make as to their quality; and counsel for the defence argued, referring to Mr. Goff's evidence, "that there was enough elicited from him which would lead any sensible party to suppose that there were other bags of seed lying about, and, consequently, a mixture of rape and swede might occur;" that "the shopmen of Mr. Goff, not being long acquainted with the business, and in the hurry of the sowing season, might have sold the rape for turnip seed." In the opinion of the Judge, the case turned altogether on the question of warranty; and as the matter is one of general interest to the public as well as to the trade, we give the Judge's charge to the jury:

He said, "Gentlemen, in this case, the allegation which was made is a very important one, namely, if warranty was tendered. Mr. Berry has not shrunk from the great responsibility which would lie upon his shoulders, for he candidly confessed he gave one; and the nature of a warranty is, gentlemen, that the defendant in the present action acknowledges himself liable for every mistake in the growing of the seed. There was nothing to show that the plaintiff was aware of the defect; and it would be difficult to account for it, because there was not found in the same bag good seed and bad. That there was rape and turnip seed cannot be denied. There was also two or three good crops from the produce, and taken out of it also. Well, whatever difficulties arise out of the warranty I allude to, the defendant has made himself responsible. Mr. Goff was supplied with the seed by the defendant, and whether no other person supplied him with other seed there has been no evidence produced. Whatever difficulties may be entertained relative to the extraordinary phenomenon about the two seeds coming out of the same bag, it was for the defendant to show; and if you are of opinion that it was the defendant sold Mr. Goff the seed, it will be for the defendant to extricate himself from the dilemma. He is bound by his warranty; or if Mr. Goff did not get seed from any other individual, the

defendant must be answerable for it. I won't let the case rest merely upon that supposition, for every judge is fallible; and if my view is not sustained, I will point out another. I will refer you to the observations so shrewdly and so learnedly propounded by Mr. Pallas, at the close of his able address. If you feel satisfied with his view, you will find for the plaintiff. The damages that he claims amount to £311 7s. 6d., and I leave it with you, whether you are satisfied that the defendant is, under the circumstances, entitled to them, or that he has established his claim. In fact, if he had shown the seed came from London, he ought to account for how it had rape mixed up with turnip seed, and both in the same consignment. There may have been in the management of it, coming from abroad, some defect. The manager for the defendant, a Mr. Dowling, when he was told of the occurrence, and the amount of uneasiness manifested on account of the seed failing, came down immediately. Now, Mr. Dowling was produced as a witness, and it is also for you to say whether he extricated himself from the statement which he made to Mr. Goff, namely, when he was informed about the second

parcel being bad, he replied, "Oh! well, indeed, they must have taken it out of the small bag?" (alluding to one in their premises in Dublin). But still, it was not from the small parcel containing the 14 lbs. that the great damage was done. It is for you finally to judge if his evidence was satisfactory in reply to the counsel, when he was asked for an explanation. He was cross-examined about whether he made inquiries about the purchases from other persons—the parties alleged to have bought seed from Mr. Goff. I think his reply to the question was right. If you believe that inquiries were made, it corroborates Mr. Goff; and if you deem him exonerated from buying seeds anywhere else, it fortifies him also. If that be so, it will be for your consideration whether any of the grounds mentioned are justifiable, and in that case you will find for the plaintiff, who must also be allowed costs as part of loss arising from the bad consignment in the first instance."

The result was that the jury found for the plaintiff the amount claimed, with costs; and we observe it is stated in the *Leinster Express* that £500 will barely defray the costs of the action.

FOREIGN AGRICULTURAL GOSSIP.

Increased attention appears to be turned to the use of manures in France. M. Barral has repeatedly directed the notice of French agriculturists to the manures of MM. Robert, Devrier, Mosselman, &c., and has advocated as much as possible the use of guano. On the majority of the lands of the west of France the use of black animal manure would render great services, and much advantage will doubtless be derived one day from the phosphate of fossil lime, the bearings of which in the Ardennes have begun to be worked of late years. But if nothing is more simple than to collect nodules of phosphate of lime, it is altogether a different affair to make them assimilable by plants. It is satisfactory to find that after many attempts there is a well-conducted establishment in France which makes phosphate of mineral lime in which agriculturists can have confidence. This establishment is that of M. Cochery at La Chapelle, near Paris, M. Cochery having profited with intelligence from the experiments and explorations which MM. de Molon, Thurnyssen, and others, had previously carried on, although the failure of his predecessors was not calculated to encourage him to persevere in the path which he has followed. The nodules are washed at the moment of their extraction from the quarries, and they are then forwarded by railway from the Ardennes to M. Cochery's works at La Chapelle. On their arrival at the works, the nodules are sifted and carefully freed from foreign stones, the workmen engaged effecting this operation with certainty and rapidity. The nodules are then thrown into the machines, which break and pound them until they only form fragments of the size of peas. From thence they pass into mills, which reduce them to a powder as fine as flour. There are at the La Chapelle establishment five pairs of stones occupied with this new kind of grinding. On leaving the mills, the powder is immediately put into sacks, which are duly weighed, &c. Between March and September of the present year—that is, six months—M. Cochery has sold 2,000 tons, at the rate of £2 per ton; and last year he made 1,500 tons, which served as an experiment, and demonstrated the efficacy of this phosphated powder. The works are now organized so as to produce a very considerable quantity annually, and the bearings which are being worked in the Ardennes appear likely to respond to the requirements of a very large consumption. A great deal of the efficacy of the fertilizing agent which M. Cochery is producing on so large a scale, consists in the fineness of the powder, on which dissolving influences act with

very great facility. French agriculture will do well to seek its additional manures in the great bearings which present in some degree indefinite resources, and the bearings of phosphated nodules in the Ardennes have precisely this character. Phosphate of pulverized lime, such as that which M. Cochery makes, could be employed advantageously in the fabrication of manures, or other useful elements could be combined with it. By this means the price of guano, which the Peruvian government has endeavoured to raise unduly, could be maintained within very narrow limits.

The agricultural society of the Gard held its annual exhibition on the 6th instant, on the Pirech-Ferrier estate. At this meeting rewards were offered both for labourers and proprietors of tried implements recognized as the best. On the 18th, the agricultural committee of the arrondissement of Remorantin, which has rendered very great services in Sologne, held its annual meeting in the chief town of the canton of Selles-sur-Cher; this is the twentieth *fête* of the association. The gathering of the committee of the canton of St. Pol de Léon (Finistère) was held on Thursday, Sept. 17. Special prizes were offered here for the best utilization of liquid farm-yard manure; and others were also given for improvements in the production of butter. Yesterday (Sept. 20) the annual meeting of the committee of Aunay-sur-Odon was held on the property of the Prince de Broglie, at St. George's-d'Aunay (Calvados). Prizes were awarded, not only for reproductive animals, but also for fat stock; the programme also included a number of special prizes founded by MM. de Grouchy, Victor Châtel, Raoul Baudouin, the Marquis de Briges, &c. Yesterday the agricultural committee of the arrondissement of Tarbes also held its annual meeting at Maubourquet; a prize was given for the bull which appeared to unite qualifications most adapted for the circumstances of the district. On Sunday next—Sunday being the time for *fêtes* of every kind in France—the agricultural committee of the circonscription of Ribeauville (Vosges) will hold its annual show at St. Marie-aux-Mines; prizes will be awarded for the best meadows, the best liquid manure ditches, the best stock, and the best agricultural and viticultural products generally. So much for France. We may also note that an agricultural exhibition commenced on Monday and closed on Friday at Fosse, in the province of Namur, in Belgium; the programme here comprised prizes for stock, ploughing implements, and agricultural products. Next year it appears that an agri-

cultural meeting on a large scale is to take place at Moscow, the venerable capital of old Russia. A public sale of reproductive animals was to come off at Lyons, in the park of the Tête-d'Or. This sale will comprise horses, cattle, sheep, and pigs of the most varied breeds.

Some discussion has arisen in France with reference to the effects of the recent extreme drought on the production of forage. M. René Bethmont, of Ruffec, in the department of the Charente, has published a letter on the manner in which cereals should be cut, so as to enable trefoils to succeed in years of drought. M. Bethmont observes: "Trefoils were sown this year in the spring on my farm in wheats and sometimes in oats. This year 16 acres which should have been regularly cropped with wheat were not so sown, but were devoted to summer oats instead. By the side of the oats in the same piece were 16 acres of wheat, the whole having received drainage, farmyard manure, and lime, and that too with a liberal hand. The wheat was good, and the oats were not inferior to it. The trefoil sown in the wheat, without being fine, was, nevertheless, acceptable for the year; but the trefoil sown in the oats, although it rose well, is now totally burnt up. I have sought for the reasons of this difference. In my opinion the trefoil sown in the wheat was protected from the sun by straw, which I leave at mid-height, and which I cut only after the first rains. This straw served as a shelter for the trefoil, which was enabled to vegetate favourably under its shade. Oats, on the contrary, are mown; and the trefoil, protected up to the time of the harvest, then found itself, when in a very tender state, exposed without shelter to the ardent rays of the scorching sun of 1863. The consequence was it was virtually roasted. I think it is worth while to note this fact—first, because it can be controlled by other observations; and secondly, because if it is recognized as true, it may justify an old custom now perhaps too much abandoned. Almost every one now-a-days cuts his wheat near the ground; but is it a good plan? Would it not be better for a farmer to cut the ears as quickly as possible, and then to thresh and sell his grain, and not to overcharge himself at the time of harvest with three-times the transport expenses and operations really required? Putting aside, however, these questions for the present, I think it would be interesting to ascertain if an advantage would be gained by cutting wheats high, and whether protection would be secured to trefoil sown in wheats against the rays of the sun. I cannot attribute to any other cause the difference between my wheat-trefoils and my oat-trefoils. M. Fennebrecque, of Mettray, and M. M. Vilmorin and Andrieux have also joined in the discussion; and one of these gentlemen observes: "We have just traversed a period of drought which has 'paralyzed' all the forage which the season offers in abundance to animals in ordinary years. In a dearth so general, I can only applaud myself for having had recourse again to the moha of Hungary. Sown in the course of June, during a dry time, I did not reckon on its success, and even expected that it would be sacrificed. Some light and insignificant rains sufficed to develop it, and a very fine crop has now been reaped, of which my animals have shown a high appreciation. A gentleman, who has retired from the army, and who has just made his *début* as a cultivator, has come to me, during the last few days, to confide to me the embarrassments in which the drought has involved him, as he has animals to feed, and no forage or pasturage to give them. He committed the sin of envy when he saw my moha, and promised to make a trial in the same direction another year, although it is too late for him to try the experiment in 1863. Moha is like the majority of new plants, which have their enthusiasts at first, and are then neglected when the circumstances which caused them to be sought after have disappeared. It is so long since I have

cultivated it, so as to remedy any scantiness of forage, that I cannot ignore, or prove forgetful of the merits of this panacea. At this moment I have only one regret, and that is that I have cultivated it on a larger scale this year; and I propose, in 1864, to cultivate a portion in May, a portion in June, and, finally, a portion in the last few days of July." The dearth of forage has been severely felt in some parts of England, as well as in France; and, therefore, these observations will probably be read with interest. The great plains of France must have been scorched terribly this year, and no wonder that French agriculturists are casting about for remedies with which to cope with very distressing difficulties.

Some new decorations have been awarded in France for services rendered to agriculture, the following gentlemen having been named chevaliers of the Legion of Honour: M. Compagnon de Taëns, one of the officials engaged in the general direction of Forests, for 39 years' service; M. Thomas Deschênes, another official engaged in the administration of Crown Forests; M. Canu, sub-inspector of forests, charged with the management of the imperial domains at La Motte-Beuvron; M. Henry Doniol, landed proprietor in the Haute-Loire, author of several highly-esteemed works on agriculture; M. Victor Borie, author of other esteemed writings on agricultural questions; M. Béranger, miller, for notable progress achieved in milling industry; and M. Lefas, farmer, in the department of the Ille-et-Vilaine. Several of these names have of course been long honourably known to the French public. M. Victor Borie has the faculty of treating economic questions with skill and of dealing with most difficult subjects in language readily understood by persons comparatively little acquainted with the science. M. Borie is now editor-in-chief of the *Echo Agricole*, in which post he succeeded the respected and lamented M. Pommier. Among M. Borie's works on agricultural topics may be mentioned "The Twelve Months," in which he describes the labours of the cultivator at each period of the year. This is in some degree the development and continuation of a small elementary treatise entitled the "Labours of the Fields." In two volumes having the title of the "Rustic Year" he undertook to sum up the principal agricultural and economical questions agitated every year; and previously he had collected in a work entitled "Agriculture at the Fireside" several articles which originally appeared in the *Presse* and the *Sidèle*. M. Henry Doniol, besides many comparatively unconsidered trifles, is author of a "History of the Rural Classes in France"—a book considerably and justly esteemed. He has also investigated the abolition of feudalism in England, and he has been constantly a member of juries and an official reporter at district exhibitions since 1861. M. Lefas, a member of the general council of the department of the Ille-et-Vilaine, and occupier of the Champegnais estate, has displayed an energy which has caused him of late years to occupy an honourable position as an agriculturist in his department. M. Canu is at the head of the imperial domains of La Motte-Beuvron, and has directed with much skill and effect the agricultural experiments which the Emperor Napoleon has carried on in the Sologne district.

Some sensation has been created of late in France—to pass on to other topics—by numerous experiments instituted by M. Daniel Hoolbreuck, who is said to have devised a process for the artificial fecundation of cereals. The Emperor has made a visit to the estate of M. Jacqueson, on which M. Hoolbreuck has commenced his experiments; and the *Moniteur* has since published a memorandum by M. Hoolbreuck himself, and a note announcing the appointment of a commission intended to direct authentic experiments which have been undertaken. We append a few sentences from the memorandum of M. Hoolbreuck, who observes: "I bring under the notice of

agriculturists a certain process for producing every year half as large a crop again of cereals as is obtained under ordinary circumstances, without expense and in a manner so simple that every one may practise the process as soon as he knows it. My method is the artificial fecundation of cereals; and the instrument with which this object is attained is a fringe of wool, which is carried over the head of the ears at the period of their flowering. In other respects, nothing is changed in the necessary operations of tillage, manuring, and sowing." After a variety of "general preliminaries," M. Hoolbreck comes to the point as follows: "It may be observed generally in the vegetable kingdom that the pistil, or female organ, is prepared to receive the fecundation when the pollen of the stamen, which must effect it, is not yet ready. The feminine sex is more precocious than the other, and here is a new point of resemblance between the animal and vegetable kingdoms; in fact, it is a great law of nature. I may add that the female organ, or pistil, is much more sensitive than the male organ, or the pollen of the stamen. Thus rain, fog, or white frost, or the smallest insect on the pistil would suffice to prevent the fecundation; and these accidents displace or destroy the small drop of honey which, coming to the summit of the female organ, must receive the fecundating dust, and transmit it through the conduit to the ovary, where lies the embryo of the fruit. If this indispensable drop of liquor has disappeared, the dust of the stamen may come beautifully on the pistil, but it will produce nothing there. The pollen, on the contrary, is sufficiently organized to preserve itself for seven or eight years, and it loses none of its fecundative properties in that long interval. It is to supply as much as possible this fortuitous destruction and the drop of the pistil that I cover with honey the fringe of wool; and the honey of the fringe replaces advantageously that of the pistil, with which it is identical, bees not making honey, but merely collecting it. These industrious animals do not the less render us a great service, and I am not wanting in the gratitude which we owe to them when I say, parenthetically, that they do not make honey, but only steal it from vegetables. In cereals, as in all the rest of the vegetable kingdom, the embryo is much better fecundated by the pollen of a neighbouring stalk than by pollen derived from its own stalk. Each ear is a kind of family, in which the receivers are not all they might be, so long as they remain within the limits of that family; and a neighbouring ear gives a new vigour to an embryo which it has not carried, and which belongs to a different stalk, the grain fecundated by the pollen of a foreign ear being always finer than that fecundated by the pollen of an ear to which it belongs." M. Hoolbreck shows how he applies the honey-laden wool fringe to a growing crop, and adds:—"The time for the operation must be carefully selected during a period of fine weather, and the opportune moment must be calculated, after the opinions I have expressed above on the flowering. In commencing the artificial fecundation, one should go the first time as much as possible from the east to the west, because the ear which has its face to the east is always the first to become fruitful. Two or three days afterwards—more or less, according to circumstances—the fringe may be passed from the west to the east. Finally, in order not to overlook any backward ears, the fringe may be carried at pleasure two or three days later, and the field will then be completely fecundated. This operation has been carried on in this manner on 160 acres of cereals on the Sillery estate (M. Jacquesson's), and the results obtained were, that while non-fecundated rye produced 22½ litres per are; some fecundated yielded 34½ litres per are; some non-fecundated wheat gave 80½ litres per are, and some fecundated 41½ litres per are. [The word "are" must not be confounded with the English expression, acre—

it represents an extent of about 114 square yards English. A litre is a measure containing 61,183 cubic inches]. These results have been sufficiently indicated by a commission composed of MM. Payen (a member of the Institute), Dailly (a landed proprietor and cultivator at Trappes), and Simons (an official in the department of the Minister d'Agriculture, Commerce, and Public Works. The field from which the different specimens were taken was identical throughout, as regards tillage, manuring, and sowing." We shall hear M. Hoolbreck and his ingenious ideas in mind, and shall revert to them on a future occasion.

Among miscellaneous items of interest we may note that the Emperor Napoleon sent to a great agricultural exhibition recently held at Odense, in Denmark, a lot of sheep from the Rambouillet fold, which excited the lively attention of visitors. On the close of the exhibition the president of the Danish Agricultural Society forwarded to his Majesty a commemorative gold medal, accompanied with a letter in which he observed: "The agricultural population of Denmark has experienced a just pride in the high favour with which your Majesty has honoured them in deigning to send to the exhibition at Odense a specimen of the celebrated flock of the imperial sheepfold of Rambouillet. They have seen in this gracious act, not merely a mark of kind feeling towards agriculture generally, the development of which in France is protected by your Majesty with so much *éclat*, but also a token of sympathetic interest for Denmark." Agriculture in France must not only be "protected" by the Emperor, but it must learn to go alone, and see a government, whether it is imperial, royal, or republican, taking an active interest in the progress of measures of useful amelioration. Certainly, our foreign friends are singularly comprehensive in their ideas. Thus the committee of the Wissembourg Agricultural Society, which held its annual meeting at Seltz, Sept. 19, 20, and 21, announces in its programme medals for mayors who have distinguished themselves by the improvement and maintenance of rural roads, or by the creation of new roads. What English society ever dreamt of introducing such a prize as this? But then it is such a "tight little island," and communications are almost everywhere perfect in it. We might go gossiping on, and speak of improvements which the Eastern of France Railway Company has introduced in the transport of agricultural products; but probably the reader has had enough for the present.

REVIEW.

DAVY'S DEVON HERD BOOK. Edited by Captain TANNER DAVY. Vol. iv. Longman and Co., London.

In reviving the fortunes of the Cirencester College, Captain Davy has been very judiciously selected to speak to the merits of the Devon cattle, as Mr. Duckham to the standing of the Herefords. Both are very able champions of their several sorts, the authority and experience of either being pointed, as it were, by their labours as editors of the companion Herd Books. Research of this kind must tend to keep a man continually alive to every possible bearing and phase of his subject; and as both these gentlemen have been also selected in turn to officiate as judges at the Royal Shows, while both again have themselves been successful exhibitors of stock, it will be interesting to see which can make out the stronger case, and incline the twig of the youthful mind to whole reds or whitefaces. It is not many months since that Mr. Duckham brought out another volume, and Captain Davy now puts his up in a very complete form, giving not merely the pedigrees of the different animals, but also the performances of such as have been prize-takers. This is a very excellent feature in such a work, as one, we believe, already adopted by Mr. Duckham, and that should certainly be carried out in any really useful register of a breed. The fourth volume of the Devons is of more bulk than its predecessors, in itself a goodly

sign, while it is very conveniently arranged, and clearly printed. It is, moreover, illustrated with a couple of clever lithographs of the best Devon bull and cow at the Great Battersea Show, and both the property of Mr. James Davy,

of Flitton, a near relative of the editor's; thus affording some further proof of the fitness of the letter for the labourer he has entered upon with so much natural inclination, and, as it is satisfactory to add, with as proportionate success.

CALENDAR OF AGRICULTURE.

This is the general month of sowing wheat. Seed-furrow the land quickly as can be performed. Sow without delay. Have the seed all ready dressed and measured: steep it in stale urine or salt water, or in putrid leys, and dry the seed with hot lime for the drill machine or sowing by hand. Cover by harrowing, and open the water-furrows at the end of each day.

Dig the potato crop with the plough, or, better, with pronged forks, which pierce the soil for the admission of air and moisture. Place the tubers in long ridges or in round piles, thatched with turf or earth. Secure beet, parsnips, and carrots in a similar way. Remove Swedish turnips from lands to be sown with wheat, and plough all these lands, and sow quickly. These operations afford a very busy employment during this month of wheat sowing.

Put rams to the ewes: 1 to 50, assorted by the respective qualities. Mark each ram and the ewes he serves, in order that the progeny may be distinguished. Mark all ewes that are impregnated in each fortnight, for the purpose of a regular lambing in the spring. Keep the ewes on good pasturage; if it is bare, assist, by giving turnip-tops. Allow the rams to remain six weeks with the ewes.

Put live stock of all kinds to winter food, unless the season allows the animals to remain in the fields every night, as in favourable weather: the fattening animals in twos and fours together, in yards provided with sheds, and the keeping stock in lots of six or eight together. Give fresh turnips daily, and litter amply. Let the calves of this year have a comfortable yard, a supply of fresh water,

and a regular feeding with small turnips and tops, and abundance of fresh straw daily. Feed milch cows with cabbages and beet root, and with hay and chaff alternately.

On dry lands, as sands and chalks, fold the sheep on the turnips, giving a fresh breadth daily; or cut the turnips, and place the slices in troughs, folding the sheep regularly in the ground behind. If the land be damp and poaohy, carry the turnips to a grass or stubble field, and spread them thinly and regularly over the field—this mode is in many cases the most preferable. Give the lambs and the fattening flock a full and very ample feed—the ewes and the store flock one-half less—to keep the animals in fresh condition.

Put swine to fatten—two in a sty together, and use steamed food, potatoes, and meals. Give the store pigs raw potatoes and light grains, and steamed food occasionally. Have the steaming apparatus in good correct order. Use steamed food for all live stock, as horses, cattle, and swine.

Anoint sheep during this month, to kill lice and vermin. Use a bathing of tobacco liquor with a wine glassful of spirit of tar to a bottle of liquor: and a bottle over each animal. Sheep are now dipped in Bigg's Composition, a chemical preparation, of which the patentee furnishes the materials and the necessary directions of use. The success is complete on all lowland and moderately elevated situations. On the highest grounds of sheep walks the first prescription is still used.

Sow winter vetches for a late cutting in the spring; but early-sown spring vetches will often come as soon: no farmer can have too many acres of such a valuable succulent plant.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Cape broccoli requires early care, and as each head is cut the stump and leaves ought to be removed, and when dry burned for the sake of the ashes. Spring broccoli plants should now be sloped down, the heads to the north, and the earth brought up nearly to the leaves, or if in trenches the stems ought to be landed up.

Beet root and carrot are partially dug up, and stored in sand for early use.

Cauliflowers in frame, or under glasses, must have an abundance of air.

Finish the planting of cabbages as soon as possible.

Tie up some good plants of endive for blanching, and draw fine earth about the stems. Keep the

winter spinach clear from weeds. Sow small salads once more, also a few Mazagan beans.

Asparagus beds must be brought into winter order, not waiting for the ripening of the seeds. Cut all the haulm to within two or three inches; remove every week; then dig trenches on each side a foot deep, and spread the earth over the beds or rows; turn the haulm into these trenches, treading it even at bottom, and sprinkle half-a-pound of salt over it in every trench, 20 or 25 feet long; finally, fill the trenches level to the ground with leaves and half-decayed stubble dug up in autumn.

Seakale may be treated in the same way. The leaves of all vegetables ought to be returned to the soil, but deeply buried.

Rhubarb and artichokes are also thus mainly

assisted, the dung in the trenches becoming an admirable earth—omitting the salt.

Raise and store dry the potatoes, the second early; and all kinds with a yellow haulm.

Dress and clean all quarters of ground; incorporate manure; and ridge-dig beds of heavy soil.

FRUIT DEPARTMENT.

Trees and shrubs, deciduous and evergreens, are safely planted between the middle and end of the month, on a dry bottom of 15 inches, with a mulch

over the soil; but no dung in mixture, as top-dressings may be the best of all manurings.

Gather and store apples and keeping pears—the latter in a warm room.

FLOWER GARDEN.

Place greenhouse plants in airy situations, with a southern aspect—as heaths, cactuses, pelargoniums, and camellias in the few that may be kept. Neatness and a clean order is now the chief attention in any flower grounds or shrubbery.

THE METEOROLOGY OF SEPTEMBER.

The four days which closed the month of August were somewhat warm, and the average daily excess of temperature amounted to 0.8° . The highest points reached by the thermometer in shade, on those days, were respectively 73° , 71° , 72° , and $68\frac{1}{2}^{\circ}$, whilst the readings in the sun's rays all exceeded 100° , and were severally the following:— 110° on the 28th, $111\frac{1}{2}^{\circ}$ on the 29th, 109° on the 30th, and 100° on the 31st August. A thunderstorm occurred on the night of the 28th, during which rain fell heavily, the fall amounting to a little more than a quarter of an inch. On the 31st rain also fell; but only to a small amount, namely, 0.06 inch.

Rapid fluctuations in the atmospheric pressure occurred to the end of August, and from the 1st of September to the 9th these changes continued day by day (the variations seldom exceeding a quarter of an inch in amount), indicating a constantly unsettled state of weather. Thus, we find that rain fell generally on each day from the 2nd to the 10th of September, excepting the 8th, and the aggregate amount collected during that period was 1.59 inch, or at the average rate of 0.2 inch daily. On the night of the 9th a thunderstorm occurred, which continued more or less heavily from 10 p.m. till after midnight, and rain fell to the amount of 0.4 inch. Notwithstanding this constant daily rain-fall, the atmosphere continued generally dry, the degree of humidity for the 7th being as low as 66 , slightly exceeding 70 on the 1st, 3rd, 6th, and 10th, whilst on the other days it exceeded 80 .

The principal effect produced by this rainy weather appears to have been a greater degree of cold, the temperatures from the 1st to the 9th (rejecting the 3rd, which was exceptionally higher than its average to the amount of 2°) were in defect to the daily amount of $2\frac{1}{2}^{\circ}$, as compared with average values.

After the 19th the barometer increased steadily, and reached a maximum reading of 30.2 inches on the 14th, then decreased to 29.9 inches by the 16th; again increased by the 17th to 30.0 inches. The weather during this time continued fine, although still cold; the mean deficiency of temperature on the 10th and 11th amounting to rather more than 5° . From the 19th to the 17th the average daily deficiency of mean temperature was much less, amounting only to 1.8° ; the daily quantities varying in amount between 1° and 4° . The 18th and 19th were fine, although cloudy, and were much warmer than the several preceding days, the mean daily temperature values for those

days exceeding their respective averages by $\frac{1}{2}$ and $4\frac{1}{2}^{\circ}$.

It may here be instanced as somewhat remarkable that from the 11th to the 19th, a period of nine days, no rain whatever fell.

From the 20th to the 26th a cold period prevailed, during which the mean daily deficiency of temperature amounted to $4\frac{1}{2}^{\circ}$. The increased cold of this period was accompanied by a remarkable depression in the mercurial column, which steadily declined from 29.98 inches on the 17th to 28.78 inches on the 22nd, and then almost as steadily increased to 30 inches by the 26th. Rain fell heavily on the 20th to the amount of 0.7 inch, and also in small amounts on the four following days, to the total amount of 0.28 inch. On the nights of the 23rd and 24th, with a perfectly clear sky, frequent flashes of lightning were observed—a very singular and uncommon phenomenon.

Examining the tables of results, the following facts are readily deduced, that the highest barometer reading occurred on the 14th, and was 30.20 inches; the lowest was 28.78 inches on the 22nd, giving a range (within 8 days only) for the month of 1.42 inch. The highest temperature in the shade was 72.8° on the 28th of August, and the lowest 40.8° on the 23rd of September, making a range of 32.0° . The highest reading attained by a black-ball thermometer in the full rays of the sun was 111.5° on the 29th of August; the lowest temperature on the grass was 31.0° on the 26th of September. The dampest day in the month was the 24th; the driest day was the 7th. The total amount of rain collected from the 28th of August to the 26th of September was 2.87 inches—an amount somewhat exceeding the average value for the month. The number of days on which rain fell amounted to fourteen, which is also in excess of the average number.

The past month, therefore, has been distinguished by the following features: Firstly, by its somewhat cold and rainy nature; secondly, and more markedly, by the undue prevalence of the S.W., or some kindred wind, which have prevailed on at least twenty-nine days out of the month; whilst the average number of days on which the wind blows from S., S.W., and W. directions collectively, in the month of September, are about twelve—thus exhibiting an enormous preponderance of those winds in the present instance. No other feature of the month seems to call for special remark.

METEOROLOGICAL ELEMENTS FOR THE NEIGHBOURHOOD OF LONDON;

FROM AUGUST 28TH TO SEPTEMBER 26TH, 1868.

Month and Day.	Temperature of the Air in Shade.			Highest Reading of a Thermometer in the full Rays of the Sun.	Temperature of Vegetation.*	Degree of Humidity. (Saturation=100).	Amount of Cloud, 0 to 10.	Amount of Rain.	General Direction of the Wind.	Weather Remarks.
	Highest.	Lowest.	Mean.							
1868.	°	°	°	°	°			Inches.		
Aug 28	72.8	51.0	61.0	110.3	44.3	74	6.5	0.26	s.w.	Cloudy; thunder at night
29	71.0	51.3	59.3	111.5	45.2	79	4.3	0.00	s.w.	Fine; few clouds
30	72.1	50.1	60.3	109.0	40.7	67	5.7	0.00	s.w.	Fine; night overcast
31	68.4	55.0	59.6	100.0	49.1	71	5.8	0.06	w. s.w.	Partially cloudy; showery
Sept. 1	68.0	45.2	56.2	107.0	34.1	71	2.8	0.00	w. s.w.	Somewhat cloudy; fine
2	63.3	51.8	56.1	86.0	45.5	83	10.0	0.04	s.w.	Overcast; a little rain
3	69.2	53.7	60.5	102.0	49.1	72	7.8	0.01	s. s.w.	Variable; occasional rain
4	66.0	49.9	56.8	93.5	42.7	81	8.0	0.37	s.w.	Overcast; frequent rain.
5	65.3	46.8	55.1	88.8	37.8	84	8.8	0.24	s.w.	Fine morning; rain at night
6	64.0	46.2	54.0	88.8	38.0	75	9.0	0.15	w., s.w.	Generally cloudy; rain
7	66.6	50.6	57.6	106.0	42.0	66	3.5	0.31	s.w., w.	Partially cl.; rainy morning
8	64.1	46.7	54.8	93.3	38.1	79	10.0	0.00	s.w.	Overcast
9	65.5	50.8	56.2	89.0	38.4	87	7.3	0.47	s.w.	Gloomy; thunder at night
10	60.7	46.7	52.3	84.2	44.1	72	4.8	0.00	n.w.	Variable; lightning at night
11	63.0	42.3	52.3	89.5	34.2	74	8.0	0.00	n.w. s.w.	Generally cloudy
12	66.2	43.8	54.4	98.5	35.2	76	9.3	0.00	s.w.	Generally overcast
13	65.8	49.5	56.9	91.2	40.5	75	8.0	0.00	w.	Generally cloudy
14	60.3	44.5	52.6	74.0	35.9	86	10.0	0.00	w.	Overcast
15	60.6	51.3	56.5	78.5	46.9	70	9.8	0.00	w. s.w.	Overcast generally
16	65.9	51.1	56.2	100.2	50.2	72	9.0	0.00	w. n.w.	Generally cloudy; fine
17	65.9	43.8	53.8	99.0	41.7	76	2.5	0.00	w.	Fine day; clouds variable
18	67.0	47.9	56.2	102.6	39.2	71	3.8	0.00	s.w.	Partially cloudy; fine
19	71.8	50.8	60.4	104.6	43.4	75	7.5	0.00	s., s.w.	Cloudy; clear at noon
20	61.1	46.8	49.9	88.3	42.5	74	6.7	0.69	w. s.w.	Rainy morning; clear night
21	61.7	45.5	50.6	101.0	38.5	78	7.3	0.01	w. s.w.	Partially cloudy
22	60.8	45.1	51.2	87.0	36.4	75	7.3	0.06	w. s.w.	Partially cloudy; a little rain
23	60.1	40.8	49.9	93.0	31.3	76	3.8	0.04	s.w.	Var.; clear night; lightning
24	58.3	43.1	48.9	84.5	34.6	90	6.8	0.17	s.w.	Var.; showery; lightning
25	63.0	42.1	52.0	93.7	34.4	78	2.8	0.00	s.w.	Fine; few clouds
26	63.2	41.7	51.8	94.0	31.0	77	8.0	0.00	s.w.	Generally cloudy

* The "temperature of vegetation" is that obtained from a self-registering thermometer placed on the grass at night. It is therefore a minimum reading for the previous twenty-four hours.

TABLE SHOWING THE PRINCIPAL FLUCTUATIONS IN THE ATMOSPHERIC WAVE, FROM AUGUST 28TH TO SEPTEMBER 26TH, 1868.

1868. Month, Day, and Hour.	Reading of Barometer.*		1868. Month, Day, and Hour.	Reading of Barometer.*	
	Highest.	Lowest.		Highest.	Lowest.
	Inches.	Inches.		Inches.	Inches.
Aug. 28, 9 a.m. ..	29.52		Sept. 7, 9 a.m. ..		29.40
" 28, 9 p.m. ..		29.48	" 8, noon ..	29.83	
" 30, 10 a.m. ..	29.74		" 9, 9 p.m. ..		29.59
" 31, 9 a.m. ..		29.54	" 14, 9 a.m. ..	30.20	
Sept. 1, 9 a.m. ..	29.94		" 16, 9 a.m. ..		29.88
" 3, noon ..		29.59	" 17, 9 a.m. ..	29.98	
" 4, 9 a.m. ..	29.76		" 22, 3 p.m. ..		28.78
" 5, 3 p.m. ..		29.53			
" 6, noon ..	29.77		" 26, 9 p.m. ..	30.00	
				still rising.	

* All the readings are reduced to the constant temperature of 32 degs.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
SEPTEMBER.

Notwithstanding that the weather has been somewhat changeable, considerable progress has been made in harvest work during the month. About nine-tenths of the crops have now been secured, in, for the most part, fine condition, and, within a brief period, the remainder will be carried. The accounts from our leading districts, in reference to the yield of the new crop of wheat, are highly favourable. With very few exceptions, it is unusually large, and it must be admitted that we have grown a quality far superior to the general run of years. Although the various markets have been but moderately supplied with new wheat, the demand has fallen off, and prices have further receded 2s. per qr. The continued downward movement in the value of wheat is regarded with much anxiety by the growers. At the present time, owing to the large supplies of foreign produce in warehouse, and the great abundance of food on the continent, as well as in America, there is very little prospect of rising markets; consequently, it is apprehended that the splendid crop will pass into consumption at inferior prices.

The growth of barley is certainly above an average, and of very fine quality. As yet only a limited business has been passing in that article; nevertheless, the quotations have been fairly supported. Oats are turning out extremely well as to quality; but, in some quarters, the yield of beans is rather limited. Peas, however, are a most abundant crop. The demand has been chiefly in retail, at about previous currencies.

Continental advices state that the crops of wheat, almost generally, have turned out very abundant, and of good quality. In America the yield of wheat is very large; but, in well-informed quarters, it is not considered equal to last season. The low prices ruling here have checked shipments; but, from the circumstance that France will not require an import of grain during the winter months, it is evident that the bulk of the surplus produce of the States will eventually find its way to this country, partly in exchange operations.

Nearly the whole of the growth of hops has been secured. In most counties it has fallen short of the previous estimate; hence the demand has improved, and prices have had an upward tendency. The imports of foreign hops have fallen off; but we understand that very large quantities will be imported during the remainder of the year; the produce on the Continent, as well as in America, having turned out well. Present quotations range from 100s. to 180s. per cwt.

The great scarcity of cotton, and the high prices at which that article is held by the importers, have produced great firmness in the demand for all kinds of wool. Both for home use and export, large quantities of English have changed hands, and, in some instances, the quotations have had an upward tendency. The supply of colonial wool on hand for the next public sales is only moderate.

The crop of apples has fallen short of some previous years; but that of most other kinds of fruit has turned out very large.

Hay and straw have been in fair average supply and moderate request at about previous quotations. Meadow hay has sold at from £3 to £4 10s., clover £4 to £5, and straw £1 8s. to £1 16s. per load.

Notwithstanding that the weather has been changeable, considerable progress has been made in harvest-work in Scotland. The yield of wheat is certainly above an average, and for the most part its quality is good. Barley and oats are large crops, and the turnips are likely to give a heavy return.

In Ireland about four-fifths of the crops have been secured. Most accounts agree in stating that their yield, though not large, is a satisfactory one.

As regards the potato crop, we may observe that it is almost free from disease, and that the growth in all parts of the United Kingdom is quite equal to the most favoured seasons. The same remarks may be applied to the Continent; apparently, therefore, prices will rule low for some time.

REVIEW OF THE CATTLE TRADE DURING THE
PAST MONTH.

Most of the markets held, since we last wrote, have been seasonably well supplied with beasts as to number, but their general quality has shown a falling-off. Scots, crosses, and the best shortborns have, therefore, commanded a steady sale, at full quotations; otherwise, the beef trade has been in a sluggish state, and the curriers have had a dropping tendency. For the most part, the sheep have appeared in good saleable condition. Although the supplies have been rather extensive, the demand has been tolerably active, at about stationary prices. The season for lamb has been brought to a close. It has, perhaps, been one of the most successful on record. Throughout, prices have ruled high and remunerative. Calves and pigs have maintained their previous value, with a fair consumptive inquiry.

In nearly all parts of the country the stock has fattened somewhat rapidly. Very few cases of disease have presented themselves, either amongst the beasts or sheep, and the supply of food in the pastures has certainly increased. It is satisfactory to find that the whole of the foreign beasts and sheep imported during the month have passed into consumption. The system of purchasing inferior animals, for grazing purposes, has been wisely abandoned, and the result is that the health of our own stock has not suffered from an admixture with foreign importations.

The quantity of stock fattening in Holland for export purposes is represented as moderately large. Some of the sheep from that country have reached us in prime condition, and have realised from 48s. to 58s. each. The arrivals from Germany, however, have shown a want of condition. They have changed hands at from 18s. to 32s. each. No improvement can be noticed in the quality of the foreign beasts; and, in many instances, great difficulty has been experienced in effecting sales, even at low rates. About 300 store beasts have been imported during the month.

The imports of foreign beasts into London have been as follows:

	HEAD.
Beasts	11,923
Sheep	48,321
Lambs	2,739
Calves	2,213
Pigs	2,391
Total	68,587

COMPARISON OF IMPORTS.

	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
Sept. 1855	7,181	22,744	613	1,646	2,566
1856	7,084	30,605	3,000	2,772	1,539
1857	7,346	24,090	198	1,953	2,067
1858	5,999	25,488	717	2,785	2,472
1859	6,966	37,788	1,358	1,744	1,595
1860	8,120	36,381	1,089	2,200	2,188
1861	6,759	34,870	1,866	2,523	2,214
1862	7,219	32,154	1,830	2,287	2,548

The total supplies of each kind of stock exhibited and disposed of in the Great Metropolitan Market are as under:

	HEAD.
Beasts	27,710
Cows	694
Sheep and Lambs	131,760
Calves	2,488
Pigs	2,657

COMPARISON OF SUPPLIES.

	Beasts.	Cows.	Sheep.	Calves.	Pigs.
Sept. 1855	24,667	540	182,120	2,477	3,921
1856	24,002	488	182,014	2,462	2,800
1857	25,734	532	127,715	2,299	2,485
1858	27,446	588	131,150	3,210	4,281
1859	24,550	514	145,430	1,891	2,771
1860	27,080	500	144,450	3,309	2,923
1861	26,950	520	143,990	2,380	3,626
1862	28,074	526	139,270	2,364	3,031

	Sept., 1863.	Sept., 1862.
From Lincolnshire, Leicester- shire, &c.	10,700	12,480
Other parts of England ..	2,800	2,870
Ireland ..	1,800	2,900
Scotland ..	30	99

COMPARISON OF PRICES.

	Sept., 1857.			Sept., 1858.			Sept., 1859.					
	s.	d.	s.	s.	d.	s.	s.	d.	s.	d.	s.	
Bed... from	3	2	to 5	0.	2	10	to 5	0.	2	8	to 4	10
Mutton	3	4	to 5	5.	3	0	to 5	0.	2	10	to 5	2
Veal	3	4	to 5	2.	3	8	to 5	0.	3	4	to 4	8
Pork	4	0	to 5	2.	3	0	to 4	6.	3	6	to 4	6

	Sept., 1860.			Sept., 1861.			Sept., 1862.					
	s.	d.	s.	s.	d.	s.	s.	d.	s.	d.	s.	
Bed... from	3	8	to 4	3.	2	10	to 4	3.	3	0	to 4	8
Mutton	3	4	to 5	4.	3	2	to 5	4.	3	8	to 6	4
Veal	4	0	to 5	4.	3	6	to 4	3.	4	0	to 5	0
Pork	4	0	to 5	2.	4	0	to 5	0.	3	10	to 4	10

LEICESTERSHIRE.

years, and prevents the necessity of buying so largely of the foreigner to supply our wants. The long drought, which continued to the middle of August, caused a great dearth of natural food for out-lying stock. The earth was parched, and the pastures exceedingly bare, water becoming scarce in many situations, and stock was not making any progress. Happily, the great rainfall in the following three weeks came just in time to remedy these evils, and the change was rapid and extraordinary. By this seasonable watering of the dry soil vegetation was stimulated in a high degree, the pastures speedily exhibited a luxuriant appearance, the lattermaths sprung up, and all root crops were refreshed, and grew rapidly. Swedes, mangolds, cabbages, &c., which previously gave signs of only a scanty produce, now, for the most part, promise well; yet mangolds received such a check from the dry weather, that the crop cannot be estimated at an average. Swedes have improved wonderfully, are now growing, and will yield a fair produce, and we hope there will be found a good supply of this food in the winter. Potatoes, we are happy to say, show less signs of disease than for several years past; and, though the tubers are not large, the quality is good. The price of grain, in consequence of the large produce and fine quality, has had a downward tendency, especially wheat, which, in the course of the past month, has receded 5s. or 6s. per quarter. This reduced value in corn is not a pleasing fact for the farmer to contemplate; still, it must be remembered that the extra produce will amply compensate for the reduction in price; and we are confident, under these circumstances, he will find his balance-sheet more satisfactory than that of several past years. Since the rain stock has greatly improved, and both flocks and herds are now doing well, and tolerably free from disease; still, the mouth complaint is prevalent. The long season of dry weather prevented both beast and sheep fattening in the same degree as when feeding on better pastures, and the grazier, in many situations, has great reason to complain of his small profits, though meat fetches a good price. Wool still holds its value, and is not likely to be cheaper. Dairy-men have realised a high price for their butter, and cheese is expected to do the same at our approaching fair. Labourers are well employed, and the wages have been reduced to 12s. per week. —*Sept. 25.*

MID-KENT.

It is somewhat fortunate for us that the corn harvest is earlier than it is in some counties where more grain is produced, as we fear unbiassed judges will not give us credit for managing it well later in the season; for parcels that were accidentally left out when the fine weather broke up have suffered severely. Fortunately, the bulk was secured in excellent order, and the quantity and quality as good as it is usual for both these to be together, for it is not always that they accompany each other. The harvest being over, the much more important duty of securing the hops is now going on, and hitherto we may say the weather has been favourable for that purpose. The late heavy rains falling mostly at nights, the operation of the hop garden was not so much retarded as might have been expected, and the picking is going on favourably. The rain has, to a certain extent, prevented the hops from ripening and hastening on too rapidly to a premature decay, while it has been a God-send to our pasture lands, turnips, and clover; and not the least of the benefits it has brought with it is the supply of water it has furnished to our ponds, water-butts, and other sources of domestic supply, which at the end of the dry weather were in a very low state, and are even now far from being replenished to overflowing. Although we have had nearly four inches of rain since the middle of August, the thirry ground that was covered with herbage devoured the whole of it without a drop finding its way into the water-courses. It has, however, refreshed the crops; and the injury done to the hops being trifling, if any, we have reason to be thankful. The weather being now favourable for the hop-picking, it is to be hoped that all will go on well. The general expectation at the beginning of the hop-picking season will, on the whole, be realised; for, much not being expected, only about two-thirds of an average crop will be forthcoming—many districts not possessing a single garden worth picking. In the best and most favoured districts the yield will be various and also the quality; some few parcels are very good, others, more or less infected with mildew will be bad; and it is feared the tumbling price that is expected will lead to many hops

being picked this season that would not have done at the time when the hop duty was to pay. So exceedingly various are the crops this season, that it is difficult to estimate the extent of the quantity likely to be produced; but good judges think that a crop equivalent to what formerly paid a duty of £140,000 will be the outside, and one-fourth of them are expected to be of indifferent quality. Turning from hops, we are, however, consoled by the fact that our fruit crop is and has been beyond an average, *Albion* especially being good; and pears have been tolerably abundant, and, on the whole, as fine as usual. Apples are somewhat irregular, but generally a full average crop. Plums have not been so plentiful as in some years, but more than in bad seasons. Damsons are thin; while the small fruits were, in their season, as plentiful as at any period ever remembered. The greatest drawback has been the indifferent quantity of the hops in some places and their total failure in others, while the fortunate ones who have them expect to realise a good price for them. In cattle, our principal stock are stall-fed, and the number of them is smaller now than in winter. Sheep, on the whole, have been pretty well; in fact, they are always expected to do so on a dry summer, but the winter prospects for them are not tempting. Turnips are tardy; and the other feeds, as tares, rape, &c., are very backward. We are, however, tolerably free from disease; and though this is, perhaps, the least of all districts adapted to sheep farming, there can be no question but at the present time it has paid better than any grain crop. In fact, it has become a question amongst many of our corn-growing neighbours whether it will not be as well to convert some of the grain of the present year's growth into mutton before sending it to market. Unfortunately our bean crop, which is the most available that way, was only indifferent, peas being good; these last-named, however, are less esteemed in this county than in most others for their feeding properties. However, as there is yet, it is to be hoped, a considerable growing season left us before winter sets in, our green crops, now far from promising, may nevertheless progress much, so as to assist in carrying us through a winter for which our scanty hay crop affords us a very inadequate supply of fodder.

NORTH HERTS AND SOUTH BEDS.

With the cessation of the wet that intervened when the last harvest was in progress, we have been enabled to gather in the little corn that remained on the ground. This consisted only of spring corn, as, from the nature of our soil, wheat turned off early, and, ripening all together, it was soon put aside. Wheat-threshing is not very general, especially since the dullness has existed at Mark-lane; but what has been knocked out very plainly shows that it has been on the whole a splendid season, and that the breadths of wheat throughout this locality require but very little rain after the plant has once fairly covered the ground. The average yield is very good; indeed, it exceeds the expectations of the most sanguine growers themselves; and the straw being short and of good substance and colour, it has contributed to the samples an appearance and quality of the finest description. The wheat crop is thus the finest that has been known for many years; and may a tribute of gratitude be cultivated in our hearts towards a kind Providence who has laid up a store for us, and especially for our northern brethren in distress a bountiful material in the face of a coming winter. The barley crop was late, and likewise, from its ripening unequally, cutting was not general when the rains commenced, now about a month ago; some, therefore, lay in swaths, and this in most cases became sprouted, whilst in all, the colour and quality are seriously interfered with, and the straw is rendered useless for feeding purposes; what was not cut until the fine weather set in, there is not so much the matter with; but the quality in all is, as a rule, indifferent. The case with white oats is something similar to that of barley, whilst the black kinds have been somewhat benefited by the wet making them blacker and plumper; but the straw is not very sweet. Peas were mostly put away early: the drought of the early summer seriously affected them; and although there is haulm enough, yet the yield is very small indeed. Peas and beans grown together is a profitable crop, although the plan is not generally adopted: there is a late variety of pea used in Somersetshire for the purpose, and the proportions for sowing consist of one bushel of peas to four bushels of beans; beans

have then to be added at each annual mowing, as the productive qualities of the pea would soon outdo the former; it forms a capital horse-food, and from sixty to upwards of seventy bushels per acre might be grown in an appropriate bean soil. The bean crop is very light; the beals are short, and not very thickly podded; the quality of the beans is very good, but they are stained by having been soaked with the wet. Roots are very indifferent; some pieces of swede turnips have been drilled over with turnips, and in many parts midew is apparent. The crop here contrasts strongly with the luxuriant and healthy appearance borne by those in the mould and clayey subsoils of the Midland, and some of the Western Counties. The turnip crop, as a rule, is irregular; some look very bad indeed, whilst in some few cases there is not much fault to be found with them. Mangold wurstel bids fair to become an average crop. Vegetable seeds are thought to be generally good. Of course with this week everything in grain will be put away throughout these districts. Lean cattle are inquired for, and sell well. Grass is plentiful, and, from the nature of the season, the herbage is good, and of a sweet feeding description. The *Hertfordshire Express* speaks with general satisfaction of the produce throughout the county. Autumn fruit seems plentiful, and of good quality.

ISLE OF ELY.

The harvest is now generally secured, and we are enabled to form some tolerably correct estimate of its character. Reports pretty well agree in placing the wheat crop at something above an average. The exception to this appears to be on those soils where injury was sustained by the frost of the night of the 18th July. We were apprehensive that serious consequences would result, and expressed our fears in our report of the 20th of July. In all those localities where the potatoes were injured, and turned black, the wheat also suffered, and the kernel ceased to develop itself, and shrivelled up into very thin inferior grain. One, whose wheat crop suffered seriously from this inclemency of weather, told us, the other day, that he considered the crop was injured sufficiently to reduce its value one-half; and we are fully inclined to think the case is not overstated. Fortunately, the extent of district thus injured is not large, or the consequences would be very serious. We commenced harvest with brilliant sunshine, and a high temperature, and ended it amidst cloud and shower and cold. The amount of rainfall during the last fortnight of harvest was considerable. This led many of our farmers to fear a wet season was commencing, and induced them to be too hasty, in several instances, in clearing their fields. The earlier stacked corn was in very fine condition; and this includes, we rejoice to say, a very large proportion of the growth of this neighbourhood. The late rains have been highly beneficial to all vegetation. Grass fields now resemble in their verdure their wonted appearance in May. Mangolds are basking better than was expected. Coleworts are badly reported of, and we hear of much failure of plant. Sheep-keeping will, therefore, not be very abundant during the winter months, especially should those months be severely cold and frosty. Spring corn will scarcely yield so well as the wheat does; but, on the cool lands, it is a fair average crop. On hot, gravelly soils it is far otherwise; but, with the present low price of wheat, we can scarcely expect spring corn will be very high, which will conduce to the interest of stock farmers where their green crops are a partial failure. Meat realises a fair price, except pork, which loses largely for feeding. From the present state of the corn markets, it appears very probable that the consumer will gain far more by the abundant harvest than the producer.—Sept. 15.

WEALD OF KENT.

Another week will bring the hop-picking to a close; and it is with gratitude we report the termination of one of the most bountiful years with which a kind Providence has blessed our favoured isle. The weather during the greater portion of the summer was unusually hot and forcing, and the crops generally made rapid progress, so that harvest operations were nearly a fortnight earlier than usual. At one time fears were entertained that the crop would not be found equal to expectation, but they have proved entirely groundless, and instead of this, a larger crop than for many years

past has been secured. Our usual average is from five sacks to seven sacks per acre for wheat, which this year is proving to be from 5 to 7 qrs., and weighs from 62 to 65lb. per bush. The quantity brought on the market is not large, owing to the farmers being busily engaged with the hop-picking, while the stocks on hand of the old crop together with supplies of new have been quite equal to the demand. The various markets in this district have exhibited considerable dullness, and prices have given way several shillings, but taking into consideration the abundance of the crop, the price is quite equal to our expectations. The bean crop is not generally good, the haul is short, and not very thickly podded; the quality is very good, although the quantity will not be above the average. The crop of peas good. We have an unusually heavy crop of oats of superior quality, which will average from eight to ten quarters per acre, being fully four quarters above the average of most years. The late rains have been very beneficial to all vegetation. Mangolds and turnips have much improved. The potato crop is large, and tolerably free from disease, which is quite a godsend to our labouring population, and coupled with a cheap loaf, they will fare better than for many winters past. —Sept. 26.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BARNET FAIR, Sept. 4.—The supply of store cattle was large, and in fair condition. There was a moderate demand for store beasts, but the unfavourable prospect of the turnip crop necessitated cattle feeders to economise the bullock stalls, and business was steadily transacted at the following prices: Dairying cattle: Well bred square-framed Yorkshire cows in full milk made £22 to £24, small dairying cows £18 to £17, and Alderney, Ayrshire, and Dutch cows £12 to £16, well bred in-calf heifers and cows down-calving made £11 to £15. The large herds of black cattle which studded the pasture-fields east of Barnet sold freely. Well grown steers for the fatting shed made from £13 to £14, and small steers £10 to £11, good heifers £7 to £8, and Welsh milking cows £11. North Wales beasts in full condition made £8 to £16, and many droves were sold. Hereford stock comprised a fair show of large well-bred white-faced bullocks. Large store beasts made from £18 to £17, small steers £13 to £15, and beasts in full condition £18 to £20. Devon stock met a brisk demand; good three-year-old store beasts for the fatting stall made from £12 to £14, and ditto good bloods £17 to £19; and two-year-old steers £8 to £10. Shorthorn steers and heifers, full grown bullocks, well up in condition made £18 to £20, secondary steers £13 to £16, well-bred shorthorn heifers for stock fetched £10 to £13, bulls, well-grown animals £12 to £16; many were sold for exportation. Highland steers ready for the fatting shed made from £13 to £15, well-bred promising polled Scots (steers) £16 to £18, and ditto polled heifers £10 to £12, and beasts in high condition £18 to £20. Scotch runts made prices varying from £4 to £8. At the close, a large business had been transacted. On Saturday the fair was resumed, but the large sales of stock affected the previous day had considerably diminished the cattle fields; dealers were firm, and would make no concession to buyers. In the Scotch fair several droves of cattle were briskly disposed of, well-bred polled Scots and Highland steers making from £15 to £18. The supply of Scotch cattle was less than last year. Devons and Shorthorn steers realized from £14 to £18. Best breeds of store beasts fetched from 80s. to 40s. a-head more this year than at the last fair. For milch cows there was a good sale; some choice-bred large Yorkshire cows realized from £25 to £27 each. The horse show was large; neat-made Welsh forest ponies fetched 8 to 10 guineas. Among the droves of Irish colts, many well-bred promising young horses (unbroke) fetched from 18 to 26 guineas. Horses for double and single harness, 25 to 40 guineas; and young sound cart-horses, 30 to 35 guineas.

BARNSTAPLE FAIR.—There was a large show of cattle and sheep, and a good attendance. Business brisk, prices up to recent quotations. Fat cattle fetched 11s. per score; steers, three years, £14 to £16; two-and-a-half years, £12 to £18; cows and calves, £14. Sheep—ewes, 6½d.; wethers, 7d. per lb.

BRAMPTON LAMB FAIR.—All kinds of stock were well represented, excepting the better class of half-breds which were few in numbers. Of Cheviots there was a good supply, and blackfaced gimmers were never mustered in such large forces in Brampton before. The prices of half-breds ranged from 20s. to 28s., Cheviots (excepting some very small specimens) 18s. to 16s., and blackfaced gimmers from 14s. to 17s. On the whole, it proved a slow dear market, and prices were understood to be much on a par with those obtained at Carlisle.

BREDNINCH FAIR was but thinly attended, and the supply of beasts was equally deficient. The prices realised were—Ewes, 6½d. per lb.; beef (beast) 11s. per score; store cattle, 7s. per score; cows and calves, £12 to £16.

BRIDGNORTH FAIR.—Good Beasts for the knife went off readily at 7d. per lb. Cows and calves from £12 to £16. Some fine fat wethers went as high as 54s. to 56s. a-piece, and best wether sheep realised fully 7½d. per lb.; sold well, and in request. The pig market was abundantly supplied, and at all prices; best stores selling readily from £2 2s. to £2 10s. In the horse department the show of agricultural ones was good, which sold off at £22 to £30; hacks at all prices from £8 to £15, and sold well.

CARLISLE LATTER FAIR.—Of lambs the supply was unusually small, there not being one-half of the number shown at the August fair. All the breeds, however, came forward in good condition, although the heavy rain which continued to fall during the forenoon, injured the appearance of them very much while standing, and caused selling to be very slow. One lot of 120 half-breds sold at 22s. 6d., and another of 500 at 20s. 6d. and 23s. Cheviots ranged from 12s. 6d. to 16s. 6d., 14s. 6d. being a fair average. A lot of 100 crosses brought 20s. The cattle supply was very large, and far exceeded that of August. Country stock was well represented, milch cows and back and calves being shown in large numbers, and in general good condition. For these there was a capital demand, prices ranging from £16 up to £20, and in some instances £23. Among Shorthorns, which were a large supply, first-class yearling bullocks were in demand, and for these prices averaged from £8 to £9. Heavy stock of Galloways as well as of Irish shown. Highlanders a little shown.

CAWDOR TRYST.—Prices were from 10s. to 15s. in advance of last, and a good deal of business was done in crosses and polled cattle.

DUNDEE LATTER FAIR.—Fat cattle, though not very numerous, sold at from 9s. to 10s. per stone. There was a very good supply of West Highland, English, and Irish lean cattle, in addition to a large show from the district, and prices were at from 8s. to 9s. per stone, according to quality. Owing to the good supply of winter keep, dealers were very unwilling to give way in their demands. Various lots were disposed of at prices ranging from £10 to £17 10s. per head. Milk cows, of which there was a pretty large supply, brought from £11 to £18. There was a good show of draught horses; but as prices ruled high, sales were very stiff. The rates for animals sold ranged from £20 to £56. There were no sheep. On the whole, the market was a dull one, and at the close several lots were taken away unsold.

HOLBEACH FAIR.—The show of horses was quite as large as usual, and, with few exceptions, of the usual unsatisfactory description. In consequence of the scarcity of grass during the summer, and the low condition of many of the mares, the foals generally showed by no means well, although there were many good animals amongst them, the highest price obtained being 20 guineas, for which price Mr. Sam. Clarke sold a fine colt foal. The trade for both horses and foals was considered very slow.

HOWDEN GREAT HORSE FAIR.—There were not many horses shown in the streets, business being chiefly confined to the inn yards, many of which are very extensive. A number of purchases, principally of hunters and carriage-horses, were made at very high prices, ranging from 150 to 200 gu. The supply has been decidedly above the average, but business has been chiefly confined to good horses, which were greatly inquired after, and realized high prices, many of them being bought by continental dealers. First-rate hunters of high blood and celebrity, good fencers, were to be had from 150 to 200 guineas, several sales having been effected at the latter figure. Prime coach-horses for gentlemen's carriages 100 to 120 guineas, neat going active carriage-horses 40 to 80 gu. There were a good many Irish horses, chiefly adapted for

hunting purposes, which were speedily disposed of. There was a good supply of second-rate horses, but the trade in these was dull. One gentleman bought a horse two months ago for £40, and sold it again this week for £100.—**SECOND DAY:** There were a good many sales of first-class horses effected at prices fully as high as those of Tuesday. A fair business was done in army horses. We understand that one of the largest London buyers made extensive purchases for the French army. Some other dealers were also buying for the English army, and also for the Government depot at Woolwich. M. Vanden Eynd bought largely for the Belgian army and for the Italian Government. A number of valuable animals have also been sent off during the week to Russia. Several fine horses were imported from the continent, but these changed hands almost as soon as they entered the fair. There was a good supply of second-rate animals, roadsters, hacks, &c., at considerably reduced rates, the chief demand being for good horses. First-class cart-horses were to be had from 20 to 50 guineas. Strong powerful horses of an inferior description, for agricultural purposes, from about 12 to 20 guineas. Mr. Parish, of Handsworth, Birmingham, brought over 70 Irish horses, many of which realized fair prices. One of our local gentry has this week sold five first-class animals for £800. A farmer residing in the district sold four for £255. A splendid hunter changed hands for £300. A pair of Irish carriage-horses on Wednesday realised £190. This was the largest amount we heard of given for Irish horses.

ILSLEY FAIR was largely supplied, and there was a good attendance of dealers. The trade was much better than on the 26th August, and prices advanced 2s. per head.

KINGTON FAIR.—There was the largest supply and show of stock that has been seen here for some years, and with very few exceptions of excellent quality, and in prime condition. The sale, however, was somewhat slow, those having stock to sell not seeming inclined to part with them at the prices offered; eventually a fair number changed hands at prices satisfactory on both sides. The supply of sheep was far greater than has been known for many years, and a great number of flocks changed owners at remunerative prices.

LAMBERT'S CASTLE FAIR.—Barreners were in tolerable supply, at from 6s. to 7s. per score. In the sheep fair business was done at the following rates: Fat wethers from 38s. to 42s., horn ewes 37s. to 42s., down ewes 32s. to 32s., horn lambs 25s. to 32s., crossbred lambs from 24s. to 30s.

LEWES SHEEP FAIR.—The number of sheep and lambs penned was about 24,000—rather below the average. The sale commenced very briskly, and the prices realized were considerably above the average of former years. The ewes sold mostly at from 36s. to 40s., but one pen belonging to Mr. G. Penfold, of Wigganholt, near Petworth, realised as much as 47s. 6d. There was also a quick sale for lambs, and they sold at high prices, the top price that came to our knowledge being for a prime lot belonging to Mr. Humphrey, of Washington, which realised 36s. per head. We believe this was the highest price of the day. The sale generally must be considered a brisk one, and amongst the lots which were disposed of were the following: Mr. Turner, Chyngton, and Mr. Cooper, Norton, ewes 38s., lambs 25s.; Mr. Pitcher, Hellingly, ewes, 30s.; Mr. Lamb, Blatchington, ewes, 41s. and 38s.; Mr. T. Eilman, Beddingham, wether lambs, 34s.; Mr. Lester, Lingfield, tegs, 37s.; Mr. Hodson, Blatchington, ewes, 40s.; Mr. Waterman, Piddinghoe, lambs, 25s.; Mr. Kent, Southeast, ewes, 38s.; call ewes, 33s.; Mr. Kent, Iford, ewes, 36s.; Mr. Hampton, Applesham, ewes, 46s.; Mr. Martin, Ripe, wether tegs, 43s. 6d.; Messrs. Saxby and Noakes, Rodmell, ewes, 36s.; lambs, 24s. 6d.; Mr. Cane, Berwick, full-mouthed ewes, 41s.; ewe tegs, 41s.; lambs, 30s.; Mr. S. Payne, Loughton, ewes, 40s.; Mr. Ridge, Iford, ewes, 30s.; Mr. Brook, Bazhill, ewes, 41s.; Mr. John Saxby, Southeast, ewes, 40s.; lambs, 30s.; Mr. Humphrey, Washington, lambs, 36s.; Mr. R. R. Verrall, Palmer, lambs, 34s. 3d.; Mr. Hodgson, Kingston, ewes, 40s.; Mr. Leigh, Firle, lambs (seconds), 28s. and 24s.; Mr. Hall, Southwick, ewes, 39s.; Mr. W. Botting, Westmeston, ram lambs at an average of 5s. There was a very good show of rams, which commanded considerable attention, the principal exhibitor being Mr. Penfold, of Selsey. That gentleman sent 17 teg rams, all of which were sold at an average of from 9 to 10 guineas each. There were a few Welsh runts, but they were not much looked after. In Irish and Dutch heifers a considerable trade was done, many changing hands at very good prices.

ANOTHER REPORT.—The average number of sheep sent to this fair for some years back has been about 36,000, on one occasion lately the number having been 36,000; but this year, owing to a variety of causes, the supply fell considerably short of this, only 24,000 being penned. A large number of sheep changed hands at a comparatively high figure. The prices for ewes, in which a brisk trade was done, varied from 30s. to 47s. 6d., although one exceptional lot was purchased so low as 27s. per head. Lambs ranging from 24s. to 36s. each. There was a tolerably fair supply of lean stock and horses, but they did not appear to be much in request. A drove of about 100 Irish heifers met with a ready sale, at prices averaging about ten guineas each.

LINCOLN FORTNIGHTLY MARKET.—A fair supply of mutton and beef; the former made fully 7½d. per lb., and the latter 6s. to 8s. 6d. per stone.

LLANGYNIDER AUTUMN FAIR.—All the stock met with buyers, and soon changed hands at high and remunerative prices, and the demand far exceeded the supply. Several of our hill farmers in consequence of the late unsettled weather had not completed their harvest, otherwise we should have had many more sheep and hill ponies offered. Several lots of fresh mountain wethers fetched from 20s. to 25s. a head, and ewes from 14s. to 16s., all brought down from our famous Llangynider mountain, whose sheep pasturage is equal to any in the county, and celebrated for their sheep and hill ponies.

LUDLOW FAIR.—The supply of fat sheep was anything but extensive, and prices ranged from 6½d. to 7½d. per lb. Ewes were more plentiful, and sold at a trifling advance on last fair's prices. Fat beasts fetched from 6d. to 7d. per lb. A goodly quantity of store stock changed hands. Horses of every quality were plentiful, and the best fetched good prices.

NORTHAMPTON FAIR.—Of store beasts we had a short supply, with a tolerable demand; had the sheep been larger we should have had a very flat trade. The supply of store sheep, barren ewes, shear hogs, and tegs was abundant, ewes making from 37s. to 49s. per head. Shear hogs and tegs made corresponding high figures; a large number of sheep were unsold. The supply of beef short, best qualities making 4s. 6d. and 4s. 8d. per stone. There was but little mutton, which made up to 5s. per stone.

PARTNEY FAIR.—This fair consists principally of sheep for breeding purposes, and they sold remarkably well. Lambs made from 30s. to 44s. Shearling ewes from 45s. to 53s. Drapes from 45s. to 57s. A lot of Mr. Vessey's sold for 60s. The ram sales were, however, the principal items in the proceedings of the day, and gathered around the several pens might be seen most of the principal graders and sheep breeders of the county. Mr. Mackinder's sheep, of Langton Grange, sold by Mr. Briggs, reached the top figure. They were a fine lot, 44 in number. One, a remarkable sheep, was purchased by Mr. Simmons, of Wisbech, for £54 6s. The general average was £18 9s.

PENRITH FORTNIGHTLY MARKET.—Choice rivals in both classes met with a ready inquiry, but at prices below those ruling at last market. Some sheep in poor condition were exhibited, but they failed to attract many customers. Beasts brought from 7s. to 7s. 6d. per stone, sheep 7d., and lambs 7d. to 7½d. per lb.

PROBUS FAIR.—Fat bullocks and sheep found a ready sale, but that of store cattle was not so brisk.

READING FAIR.—The business generally was dull, especially in the horse and pig trade. The horse fair was stocked with a very rough lot of animals, and but very few good ones. There was a demand for the latter description, but there were comparatively few; the prices were as varied as their quality, description, and condition. Superior horses sold readily enough. The prices realised may be quoted at, for cab horses from £10 to £16, carriage horses £25 to £45, hunters £25 to £75; one noted fast trotting horse, named Excelair, realised 75 guineas, and was bought for a foreign market. Pigs were a very dull sale, and prices remained about the same as of late. There was a tolerably fair cattle market, and a steady trade was done. In the fat cattle market beef may be quoted at from 4s. 6d. to 5s., mutton 4s. 8d. to 5s. 4d., calves 4s. 4d. to 4s. 8d. per 5lbs. In the general fair store beasts, of which there was a good supply, ranged from £7 to £22. Cows and calves, which were scarce, made from £14 to £30. Barreners sold well at from £8 to £14; yearling bulls from £6 to £10.

REDDITCH FAIR.—There was a good attendance, and

things went freely, especially the cow stock, which brought a good price. Sheep realised as much money. Pigs, however, went cheap, good store pigs changing hands at about 2 guineas each. Altogether the fair was satisfactory.

SHERTON FAIR.—There was a poor attendance and a poor supply both of beasts and sheep. An active trade was driven, and high prices freely given; 58s. per head was made for a fine flock of sheep.

STRANRAER MONTHLY MARKET.—The show of stock was limited, and the quality generally inferior, consisting chiefly of a few lots of two years old, and stirks. A lot of Galloway stirks, the best shown, sold at £5 5s. per head, and a lot of two years old sold at £6 10s. each; a few others changed hands, but some Ayrshire and Irish cattle left the market unsold.

UPPINGHAM FAIR.—Nag horses made about £40 each. The prices realised for foals ranged from £6 to £35. With regard to the lambs there was an excellent show, the quality of which may be judged from the high prices offered, as much as 39s. per head being bid for one pen, which was refused. Wethers realised 40s. to 50s. each, and ewes 38s. to 45s. each; some brought £5 to £12. There was only a short supply of fat beef, which fetched 2s. per st.

WALTHAM FAIR.—Really good two-year-old colts and fillies for draught purposes made very stiff prices, whilst unbroken and middling ones met a slow sale, at reduced rates. Five-year-old horses, fit for the London markets, were eagerly sought after. Inferior and older animals not in demand. Second-class hackneys were in abundance, and sold from £10 to £12; really valuable ones scarce. Good fresh three-year-old steers sold readily, at prices ranging from £15 to £18, whilst smaller and younger beasts were difficult to dispose of, and many were withdrawn. Matted beasts fetched far remunerative prices. Localised cows and heifers were lower in price, unless really first-class.

WORCESTER FAIR.—The show of cattle was very large, but the quality was not as good as on former occasions; and there was a good attendance of buyers. Fat bullocks were in great demand, and were readily sold at from £2 18s. to £3 5s. per cwt. Lean meat met a good inquiry, and made full prices. There was a large supply of cows, mostly of rather inferior quality, which sold at from 6d. to 8d. per lb. Cows and calves and barrows, though not so good in quality as in previous years, realised prices to fully satisfy sellers. There was an excellent supply of sheep, particularly stores, between 6,000 and 7,000 being penned, some of first-rate quality, which were eagerly bought up at—ewes 7d., and wethers 8d. Lambs, the general quality of which was good, were in great demand, and sold readily at 8d., while in some instances they fetched as much as 9d. The show of rams was large, and the quality excellent. They brought generally about £4 10s.; but there was one very superior lot, of which not less than £9 10s. was made, while one was sold for £28. The show of pigs was good, and above the average quality. Most of them were eagerly bought up at from 8s. 4d. to 9s. per score. The supply of horses was very large; but few were of superior quality. A considerable business was transacted in the cheaper lots, though the trade generally was dull.

ENGLISH, SCOTCH, AND IRISH STOCK SALES.

ENGLISH SALES.—**FLITCHAM HALL RAM SALE:** The annual sale of shewing rams from this old-established flock, the property of Mr. G. Breerton, jun., took place on Friday, Sept. 4, and was attended by a great many of the principal agriculturists on this side of the county. Under the presidency of Mr. J. Beck, the auctioneer, 92 splendid shewings were disposed of, after a very spirited competition, for the sum of £264 10s., being an average of £10 7s. 6d. per head. The highest, making £21, was purchased by Mr. John Bosby, of Great Marneham. **Mrs. KIRKHAM'S SOUTH-DOWNS:** The annual sale of pure Southdown ewes, and letting and sale of rams, took place on Thursday at Long Barn Farm, Hove, near Brighton. Those present included breeders from Surrey, Dorsetshire, Wiltshire, Westminister, and other distant places. The highest price obtained was £4 18s. per head, the remaining lots ranging from 40s. to 45s., 48s., 50s., 54s., 55s., 62s. and 78s. per head. For the rams for letting the biddings were from 11 guineas to 13, 15, 18, 19, and 20 guineas. Of the rams

for sale the prices obtained ranged from 10½ guineas to 11, 12, 15, and 21 guineas. There were altogether 40 rams for letting and sale, and of these 8 for letting were not taken, and 14 for sale were put back.—On Thursday the annual, letting of Mr. T. Kirkham's rams took place at Biscathorpe, and the result must have far surpassed Mr. Kirkham's most sanguine hopes. In all 188 sheep were offered, and from the commencement the biddings were exceedingly brisk, £50, £80, £70, and even £80 being given for the use of a single ram for the year. The aggregate amount given for the 188 sheep was £2,718 10s., being an average of no less than £19 13s. 8d. The average of the shewings was £21 1s. each, two-shewers £17 18s. 6d., and of the three-shewers upwards £20 7s. 3d. All the sheep offered were taken, and there were customers for as many more.—The rams of Mr. Chaplin, of Tathwell, were let by auction on the previous Tuesday; 120 realised £1,500; one of the shewings let for £55; and another for £27; a two-shear made £50, another £25, and a three-shear £40.

STOCK SALES IN SCOTLAND.—**Prentice's** came off at Tullerum. There was a large attendance of butchers and others. The prices realised were fair, according to quality. Fat cows brought from £9 9s. to £16 10s., or 2s. 6d. per Dutch stone. Shetland heifers from £6 10s. to £7 2s. 4d. Cheviot ewes 22s. and upwards. Blackfaced lambs ranged from 9s. 6d. to 12s. 6d.—At Mr. Thomas Dods half-bred hogs brought from 31s. 6d. to 39s. 6d.; Cheviot ones brought from 25s. 4d. to 37s., half-bred ewes 25s. 4d. to 30s., half-bred lambs brought from 22s. 3d. to 26s. 8d., blackfaced lambs brought from 10s. 3d. to 14s. 6d., a lot of half-bred store hogs from 27s. 6d. to 30s., and a lot of half-bred store lambs from 21s. 6d. to 21s. 9d. Fat cattle brought from £18 17s. 6d. to £19 6s.; a calf brought £4 9s.—Messrs. Clapperton, Brand, and McNiven's (jun.), at Haddington, sold a large lot of greyfaced lambs averaging 22s., a lot half-bred ditto from 24s. to 22s., ditto at 25s. 3d. to 34s., and chest blackfaced lambs at 10s. Half-bred hogs sold from 36s. 6d. to 38s., bred and half-bred ewes from 32s. 6d. up to 43s. 3d. Cheviot ewes from 21s. 3d. to 31s. 9d., and blackfaced wethers from 31s. 6d. to 42s. West Highland cattle brought from £15 2s. 6d. to £17, and Shorthorn cattle from £14 17s. 6d. to £15 2s. 6d.—Mr. Buist's weekly sale consisted of about 500 fat sheep and lambs, and 50 fat cattle. Trade was very brisk at advanced prices for all of the best kinds. The best Shorthorn bullocks brought from £25 10s. to £27 a-head. A great number of smaller stots and Highland heifers sold from £9 to £18, and fat cows from £7 to £15 2s. 6d. Several lots of very fine half-bred hogs brought from 42s. to 45s. 6d. A number of lots of half-breds and ewes sold from 34s. up to 39s. Cheviot and blackfaced ewes sold from 16s. to 24s., and up to 29s.; the latter class of lambs brought from 22s. to 26s. A good many lots sold from 16s. to 20s. Blackfaced lambs from 9s. to 16s. Fat stags from 62s. to 68s. Fat ewes from 50s. to 75s. a head. Fat pigs from 30s. to 63s.—Mr. Walker, Portlithen, who enjoys a national reputation as a breeder of pure polled cattle, had a sale of his stock on the farm of Balquharn on Thursday last. As was to be expected, where a herd so famous was put to sale, there was a large attendance. Upwards of two hundred gentlemen partook of luncheon before the sale commenced.—Mr. Anderson, Brechin, was the auctioneer. The bidding was brisk, and the total sum realised by Mr. Walker was as follows:—13 cows 253 guineas, 16 heifers 315½ guineas, 1 three-year-old bull 25½ guineas, and 4 bull calves 41½ guineas.

IRISH SALES.—A FEW OF THE RAM SALES BY GAWLY, SONS, AND PARKER, ON THE 31st OCT.—Land Clonsurey, Leicesters; average price £3 2s. 2d., highest £10 10s., lowest £7 7s.—Loftus H. Bland, Esq., Border Leicesters; average £9, highest £21, lowest £5 5s.—T. B. Brown, Esq., Cotswolds; average £11 6s. 9d., highest £15 4s. 6d., lowest £6 6s.—Thomas Robertson, Esq., Border Leicesters; average £7 14s. 7d., highest £8 16s. 4d., lowest £6 6s.—Wm. Owen, Esq., English Leicesters; average £10 14s., highest £20 9s. 6d., lowest £7s. 7s. Mr. Gawly also sold the shorthorns of Mr. Barcroft at Kilbogget, the cows ranging from 15 guineas the lowest, to 86 guineas the highest, the latter sum being obtained, after a spirited contest, for the Flowers of Rocklands, from Mr. Anderson, of Gnee Dine. Mr. Whaley, of Whaley Abbey, bought Lania for 76 guineas, after another hard-fought battle. The heifers ranged from 25 to 76 guineas, and the calves from 9 to 30 guineas.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The month of September has not been very propitious for the completion of harvest. The first fortnight was rainy, and the corn gathered in the intervening dry days had not sufficient time to secure its condition, but the coldness of the nights prevented much sprouting. Then came a full week of really dry weather in the South, but not equally so in the North, though there it was fair on the whole; but the last week brought some return of rain and cold weather. The condition, therefore, of the late gatherings, more especially in the North, as well as in Wales and Ireland, must be very doubtful. On the other hand, the early lands, where the crops were secured, welcomed the rain for the growing roots and the grass, while it afforded great facility for getting the cleared pieces into good condition by the plough, &c.; and it is questionable whether, as a whole, the benefit has not exceeded the damage. It certainly gives a better position to those farmers who housed or stacked their corn in fine order, by relatively increased value and preference on the market; and the number of these, happily for themselves and the country, is considerable. Our last month's estimate of the produce is, therefore, but little affected, excepting in the quality; and we are still of opinion that the kingdom has an unusual produce. When first the rain came in quantity, there was a moderate rise; but the week's fine weather has more than lost the advance, as the month shows a reduction in price of about 1s. to 2s. per qr. The continental reports confirm the first belief that nearly all Europe has shared in the common plenty, nor has that land of fratricidal strife, America, been an exception to the rule of great providential care; so that we may view the whole world as having plenty in store for its immense annual wants. As compared with last year, we are exactly 10s. per qr. lower by the general averages, as they were then 54s. 9d., and the last sales note 44s. 9d. as the price. This is a great reduction from a moderate rate; but we take it that farmers, by the large increase in the yield, will be better paid than they were last year: while with such a moderate beginning there is a proportionate chance of a good advance, should seasonal disasters befall the country or its political situation involve a war, either European or American, neither of which events seem very improbable; while the power to hold a fine quality in so many instances, from its equally fine condition, is no slight advantage to growers. The unprofitableness of last year's imports has greatly reduced those of 1863 hitherto—say in wheat, flour included, to above two-and-a-quarter millions of quarters, the imports to the end of August in 1862 being in both articles equal to 6,765,888 qrs. of wheat; and for the same period this year they have been only 4,471,042 qrs., or about two-thirds of what they were then; but for the remaining four months of the year we expect,

from our own plenty and the fewness of orders sent out, that there will yet be a much greater falling off unless the low rates obtaining originate speculation for holding over. No country but the Federal states of America at all shapes its course to English markets, but there the phrensy of war puts agriculturists under a stringent necessity, so stringent, indeed, that farmers begin a resistance; and already the receipts at New York and Montreal are very much reduced; but if the Federal States choose a war with France or England, they may want the produce for themselves, and then our markets would rise in spite of the bountiful crop. The most recent prices current in the several foreign markets were as under. The top prices paid at Paris was 45s.; American red at Antwerp brought 44s. 6d., Wolgast 47s. 6d., mixed Danzig 45s. 6d. per qr. The range of prices at Amsterdam was 33s. to 50s.; the quotation for the best Saale and Wahren wheat at Hambro' were 45s. per qr. Offers from Danzig were made of new wheat at 48s., freight to London included. Prices at Odessa were comparatively higher than at any other place of export—say for Sandimirka fine 40s. to 41s. per qr. free on board. Prices at Venice were 43s. 6d. for native wheat; hard wheat at Algiers was quoted 33s., soft fine to 44s. With great dullness at Montreal, notwithstanding a large falling off in the receipts of Canadian white, wheat was quoted 34s. per qr., spring red Chicago 29s. 11d., winter red Western 31s. 7d. per 480lbs. New York was also very low in price; Chicago Wheat to 26s., Milwaukee to 27s., winter red 30s., fine amber 31s., best new white to 44s. per qr.

The first Monday in London opened on good supplies of wheat, both English and foreign. During the morning the show of fresh samples from Kent and Essex was but moderate, and, as there had been much rain during the previous week, with a still unsettled appearance about the weather, factors obtained an advance of 1s. to 2s. per qr. on the sales made, but business was by no means brisk, millers being very cautious. Not much was doing in foreign, but occasionally 1s. per qr. advance was paid. Floating cargoes were in good demand at former rates, but no advance could be realised. Accounts varied somewhat from the country; where good supplies were sent there was little, if any difference from the previous currency. This was the case at Leeds, Stockton, Frome, and Knaresborough. More generally there was a rise of 1s. per qr., as at Birmingham, Wolverhampton, Bourne, Barnsley, Bury St. Edmund's, Lynn, Market Harbro', Newmarket, Oakham, Rochester, and St. Ives; while some places were as much dearer as London, viz., Hull, Bristol, Gloucester, Spalding, Salisbury, Worksop, and Uppingham. Liverpool was 4d. per cental dearer for wheat on Tuesday, but lost some of the ad-

vance on the closing markets. Edinburgh was 1s. 6d. dearer, and Glasgow 1s. per qr. At Dublin wheat rose 6d. to 1s. per brl., and the Irish markets generally were the turn dearer.

The second Monday began on the back of a fair English and moderate foreign supply. The supply this morning from Kent was fair, but only moderate from Essex. Though some rain had fallen, it then apparently was set in again for fine weather, and some of the samples not being equal in condition to what they had been, there was a dull market at 1s. per qr. decline. The foreign trade remained on a small scale, and though some retail sales were made on former terms, prices, on the whole, were somewhat in buyers' favour. There was less demand for cargoes afloat, though only former prices were asked. The country markets this week, mostly opening on weather decidedly fine for the northern harvest, exceeded London in dulness and the reduction of prices. Several being heavily supplied, all were cheaper, the lowest decline being 1s. per qr., as at Reading and Bedford; more were down 1s. to 2s., as at Newark, Worksop, and Uppingham; 2s. to 3s. per qr. was about the medium decline, as at Hull, Louth, Stockton, Leicester, Northampton, Chelmsford, and Cambridge; York, Sunderland, and others noted a fall of fully 3s., while Boston, Malton, Newcastle, and Carlisle reported a reduction of 4s. per qr. Liverpool was 1d. to 2d. per cental cheaper on Tuesday, with a further fall on Friday of 2d. to 3d. per cental. The weather not being very fine in Scotland, Wheat was not so much reduced; but at Glasgow it was 1s. per qr. cheaper. The Irish markets were slightly lower—say generally 3d. to 4d. per cwt.

On the third Monday supplies, both English and foreign, were much as on the previous week, but the morning's show of samples was better, and with a full week of fine weather it was a very heavy market. Factors began by asking the previous terms, but with accounts of a heavy decline from many places in the country, millers would not buy without a concession of 2s. to 3s. per qr., and at this decline the stands were not cleared. The foreign trade was very small, and to make sales at all it was necessary to accept fully 1s. to 2s. per qr. less. Floating cargoes, however, not being plentiful, business was done at rates only slightly in favour of buyers. The country markets this week differed considerably. Some were disinclined to accept any reduction, as Boston, Market Harbro', Rochdale, and Thirsk; others only yielded 1s. per qr., as Manchester, Leeds, Newcastle-on-Tyne, St. Ives, and Uppingham. More submitted to the extent of 1s. to 2s., as Frome, Newbury, Rugby, Rochester, Melton Mowbray, Spilsby, Stockton, and Wolverhampton. Birmingham, Bury St. Edmund's, and Bristol were down fully 2s., but many accepted 2s. to 3s. less, as Hull, Bourne, Barneley, Lynn, and Spalding, and Malton was 4s. per qr. lower. The weather not having been so fine in Scotland, Edinburgh and Glasgow were only 1s. per qr. lower. In Ireland there was great dulness, but little decline, as at Dublin.

The fourth Monday opened on the back of good

supplies, both English and foreign; but the show of samples for the morning was less than usual. This falling off induced some factors to ask more money; but in the end they were glad to accept the previous terms, which they did towards the close of the market. The foreign trade, in consequence of the diminished supply of English growth, was firm at the previous quotations. Sales afloat were made on rather easier terms. The importations into London for the four weeks were 32,620 qrs. English, 77,161 qrs. foreign, against 19,053 qrs. English, 181,511 qrs. foreign, for the same period in 1862. The imports into the kingdom for four weeks were 553,833 qrs. wheat, 202,704 cwt. flour. The general averages commenced at 46s. 5d. and closed at 44s. 9d.

The flour trade, as might have been expected from the state of the wheat market, has been dull and declining through the month; but prices are not materially reduced—say, 1s. on country sorts per sack and 1s. per barrel on American. Many of the late American imports are getting out of order, and this has induced sales at very low prices occasionally. Indeed, fair useful barrels have been procurable at 21s. per barrel; but the scarcity of fine samples have made such relatively dear, as such would bring in small lots 25s. to 26s. per barrel. Town prices have been unvaried all through, 43s. per sack remaining the top price. The new wheat for a time worked very satisfactorily; but since the heavy rains, a mixture of old foreign or English has been necessary to make a really good sack of flour. The imports into London during the four weeks were 62,946 sacks country make, 3,050 sacks 33,781 barrels foreign, against 47,619 sacks English, 9,856 sacks 138,232 barrels foreign in 1862.

The supplies of English barley have since harvest been small; but an increase lately has taken place, and, with the low price of all other grain, malting sorts have given way during the month say 2s. to 3s., and medium qualities 3s. to 4s. per qr., while very little reduction has taken place in the rates of low grinding foreign—say 1s. per qr.—from the limited supplies. Fine French Champagne, weighing 54 lbs. per bushel, was sold at the last market at 32s., and, though it was thin, it was remarkably sweet and good-coloured. It was perhaps the expectation of further supplies of such that influenced English prices, which promise to stand well till the fine quality appeared, by which the Seale samples are undersold. Whether enough will come forward permanently to affect prices remains yet to be seen, but beyond 38s. is not now to be depended on for the finest English growth. Grinding foreign also is more likely to come down than show any further increase of value, as the new foreign will be soon coming on. The imports for four weeks into London were 10,093 qrs. British, 25,056 qrs. foreign, against 2,099 English, 30,125 qrs. foreign in 1862.

The malt trade has been steady through the month, brewers being as yet well satisfied with the new samples.

The oat trade has been singularly dull from the liberal foreign supplies, while the show of English samples on the last market almost doubled those

that preceded it. Prices, therefore, though commencing very low, have been further reduced fully 1s. per qr. without an animated trade. Indeed, 40lbs. per bushel Swedish have been sold at 19s. 3d., and some Russian under 17s. per qr. We cannot, however, help thinking that prices are at about their lowest, especially for old corn; and foreign supplies have lately lessened from the losses increased by liberal imports. The imports into London for the four weeks were—in English qualities 18,415 qrs., in Scotch 97 qrs., in Irish 3,125 qrs., and in foreign 156,960 qrs., against 16,478 qrs. English, 115 qrs. Scotch, 640 qrs. Irish, 86,294 qrs. foreign, in 1862.

As to beans, they have been very quiet, though firm at the commencement of the month, partly from the rainy weather, and partly from the fear of much destruction to the stores in Egypt by the extraordinary overflow of the Nile. The waters have, however, somewhat abated, and the week's fine weather we had in this country has calmed the fears that were entertained. Maize is now so cheap that it is much against any advance in this pulse; but on the other hand, the approach of winter will much increase the demand. No change of prices can be noted. The imports into London for four weeks were—3,576 qrs. English, 8,608 qrs. foreign, against 1,703 qrs. English, 5,080 qrs. foreign last year, showing a good increase, though stocks in granary were low.

Though peas have come as yet to hand in limited quantities, this grain has been very dull from the same cause that has influenced the price of beans, viz., the very low rates at which yellow maize has been selling, viz., 27s. to 28s. per qr. Boilers have not yet come into demand; and these remarks apply exclusively to new English for hog-feed, clays being only worth 34s. to 35s. per qr. Not much change is to be expected this side Christmas. The imports into London were—1,470 qrs. English, 1,814 qrs. foreign, against 3,075 qrs. English, 3,003 qrs. foreign, in 1862.

Linseed has been very steady all through the month, and seems likely to remain so.

In cloverseed there is no change to report, though the French have got a better crop than expected during the great heats. Trefoil has been firm, as well as fine canary and rapeseed; white mustard seed, after much fluctuation, finished dull at 12s. per bushel; winter tares down to 6s. and 6s. 6d. per bush.

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	a. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Aug. 16, 1862	45 11	31 4	23 7	36 4	40 7	25 7
Aug. 23, 1862	46 5	31 1	23 0	33 2	40 4	24 9
Aug. 29, 1862	45 9	33 10	22 8	33 9	39 6	25 9
Sept. 5, 1862	44 2	34 8	22 0	32 11	38 10	27 2
Sept. 12, 1862	44 1	34 7	21 8	31 0	38 10	26 10
Sept. 19, 1862	44 9	35 2	20 9	33 7	39 0	26 9
Aggregate Average	45 2	33 5	22 3	33 4	39 8	25 11
Same time last year	37 1	34 9	25 0	33 3	41 11	26 7

PRICES OF SEEDS.

BRITISH SEEDS.

MUSTARD, per bush., white	.....	35s. 6d. to 10s.
CORIANDER, per cwt.	.....	14s. 16s.
TARES, winter, new, per bushel	.....	6s. 6s. 6d.
TREFOIL	.....	34s. 37s.
LINSEED, per qr., bowing—a. to 74s., crushing	.....	62s. 60s.
LINSEED CAKES, per ton	.....	£9 10s. to £10 10s.
RAPESEED, per qr.	.....	62s. to 65s.
RAPE CAKE, per ton	.....	£5 10s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, Sept. 23.—We have a good demand for every description of the new growth at the following currency.

Mid and East Kents	.....	112s., 130s., 180s.
West of Kents	.....	105s., 130s., 182s.
Seasay	.....	100s., 112s., 130s.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Sept. 23.—Full average supplies of Potatoes are on sale at these markets, and the quality of the produce is excellent. The demand, generally speaking, is in a sluggish state, at fully the late decline in prices. There were no imports in London last week.

Kent and Essex Regents	....	50s. to 80s. per ton
Rocks	.....	50s. to 60s.

COUNTRY POTATO MARKETS.—DONCASTER, (Saturday last): A very large quantity of potatoes were offered for sale, but the demand was inactive, and some remained upon hand. For those sold less money had to be taken. Wholesale, 4s. 6d. to 5s. 6d. per 18 stone. Retail 8d. to 9d. per peck.—MILTON (Saturday last): The market was almost in a state of panic; all round varieties are found to be more or less diseased. Prices were mentioned at 1s. 6d. to 2s. per bushel for roughs, and 2s. to 2s. 6d. for skins, being a decline of 8d. to 10d. in the week. Speculative purchases, to lift the crop, at £8 to £12 per acre.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Sept. 23.—Our trade is very slow, and with foreign Butter fallen 10s. per cwt. it is almost difficult to give quotations of prices as to English.

Dorset, fine	.....	114s. to 116s. per cwt.
Middling	.....	Nominal.
Devon	.....	106s. to 108s.
Fresh	.....	11s. to 14s. per doz. lbs.

WOOL MARKETS.

CURRENT PRICES OF WOOL.

ENGLISH (per lb.)				SCOTCH (per 8 lbs.)			
	s. d.	s. d.	s. d.		s. d.	s. d.	s. d.
Middle hoggets	1 10s. to 1 11s.			Combing skins	1 2s. to 1 7s.		
Dicto wethers	1 8s. to 1 9s.			Carding ditto	1 3s. to 1 5s.		
KL-bred hoggs	1 9s. to 1 10s.			Head ditto	0 10s. to 1 1s.		
Down tags	1 8s. to 1 9s.			Nells	1 1s. to 1 3s.		
Down ewes	1 7s. to 1 8s.			Broken	1 1s. to 1 3s.		
Laid Highland	17 0 to 18 0			Laid Cheviot	20 0 to 20 0		
White ditto	18 0 to 19 0			Laid Cross	18 0 to 21 0		
				White Cheviot	24s. to 44s.		

LIVERPOOL WOOL MARKET.—SEPT. 26.

SCOTCH—There is still a good demand for all kinds of Scotch, at late current rates.

	s. d.	s. d.	s. d.
Laid Highland Wool per 84lbs.	17	6	19 0
White Highland do.	20	0	31 0
Laid cross	20	0	21 0
Do.	21	0	33 0
Laid Cheviot	28	0	35 0
Do.	28	0	31 0
White Cheviot	28	0	44 0

FOREIGN—There is a fair trade demand for all kinds of middle class useful wools, and more disposition to operate in fine wools, which have of late been much neglected.

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from the importers' stores, or ex ship (30 tons), £12 5s. to £12 10s. per ton.

Bones, 25 ss. to 28; crushed, £5 15s. to 25 ss. per ton.	
Animal Charcoal, 24 ss. to 25 10s. per ton.	
Coprolites, Cambridge, (in London), whole 5ss., ground 2ss. to 3ss.;	
Scotch white 5ss., ground 3ss. per ton.	
Nitrate of Soda, 41s. to 42s. per ton.	
Sulphate of Ammonia, 14s. to 15s. 10d. per ton.	
Sulphuric Acid, concentrated 1'845 lb. per lb., brown 1'712 5ss.	
Superphosphate of Lime, 25 ss. per ton.	
Blood Manure, 25 ss. to 27 10s. per ton.	
Dissolved Coprolites, 25 15s. per ton.	
Discolored Bones, 24 ss. to 25 ss.	
Linseed Cake, best American, 41s. 10s. per ton, ditto 41s. to 42 10s.	
per bag: English, £10 5s. to 41s. 10s. per ton.	
Rape Cake, 25 15s. to 27 per ton.	
Cottonseed Cake, 25 10s. to 26 10s. per ton.	

E. PURSER, London Manure Company,

116, Fenchurch Street, E.C.

Printed by Rogerson and Tuxford, 246, Strand, London, W.C.



W. H. H. 1850
A Longhorn Bull, the property of Mr. James (Duke of the County, County of Chester) and the
owner of a herd of 100, at the present, holding of the R. of the County of Chester.

From the original drawing by the artist.

PLATE III.

MELCOMBE; A PRIZE LONGHORN BULL.

THE PROPERTY OF MR. JAMES DAVIS, OF MELCOMBE HORSEY, DORCHESTER.

This bull, bred by Mr. J. H. Burbury, of the Chase Farm, Kenilworth, in the summer of 1861, took the first prize of £10 as a yearling, at the Battersea Meeting of the Royal Agricultural Society, in 1862, when the class was confined to Longhorns; and the first prize of £10 in an open class of "other established breeds," at the Worcester Show of the National Society, in 1863. Mr. Davis has been a breeder of Longhorns for the last forty years; and the Burburys, both at the Chase and Wroxhall, have kept to the breed for upwards of a century. In fact, as is stated in a well-written history, which appeared in one of the agricultural journals a year or two since; "the Longhorns can be traced as a pure-bred race for a longer period than any other breed;" while the account runs on in this wise:—"The recognized type and character of a pure Longhorn may be thus described: A broadish strip of white on the back, running from the shoulders to the rump, and pretty uniform in length; red or brindled sides; thigh and shoulder spotted; the head mottled so as to correspond with the sides of the animal, and the nose not darker than the sides, a black nose being, in the opinion of many, quite objectionable. The horns should have a graceful curve, either horizontal, or slightly inclined downwards—in some instances, forming semicircles from the root in the head to the nose. The cock, or upward-turned horn, is decidedly objectionable. The Longhorns, with a single exception, are in the hands of tenant farmers, whose object is, while they preserve the breed pure, to make them as profitable

as possible, and to keep them in a rather lean condition. The Longhorns are scarcely ever reared with the sole intention of being prize animals, and fed from an early date for exhibition; but are ordinarily drafted from the herd in full milk, and after a few months' feeding are sent to the show. It is much disputed whether Ireland or England originally possessed the longhorned breed of cattle; but the more general opinion points out the district of Craven, in the West Riding of Yorkshire, and bordering on Lancashire, as being the seat of the most valuable of that kind of cattle. Many counties of England possessed Longhorned varieties, which seem to be all assignable to one indigenous stock. Mr. Webster, of Canley, near Coventry, was, we believe, the first scientific breeder of the Longhorns, and he founded his stock on some good cows which he bought of Sir R. Gresley, of Drakelow, near Burton-on-Trent, a gentleman who took much delight in keeping a dairy of cows of similar colour and shape, and in importing bulls from Lancashire and Westmoreland. Next followed Mr. Bakewell, of Dishley, who raised the Longhorns to the greatest celebrity they ever attained. Several individuals in the Midland counties were distinguished as breeders of Longhorns, which were carried to Ireland to improve the original race. About the year 1790, however, very high prices, nearly £300 a-head for the best bulls and cows, were obtained by Messrs. Fowler and Princeps, two noted breeders of Longhorns; and 60 and 80 gs. a season were paid for bulls, limited in use. No breed, perhaps, rose more quickly, or has sunk

more rapidly, than the Longhorns; for, with the disappearance of Mr. Bakewell and his contemporaries, and their immediate successors, the breed gradually declined. A deterioration had taken place in refined breeding, from want of the interposition of remote affinities—a point not then understood, and but imperfectly even at this day. Mr. Fowler began breeding Longhorns from two cows, to which he hired a bull named "Twopenny," from Mr. Bakewell's herd. He refused £1,050 for three calves and one bull; and a cow called "Brindled Beauty" sold for £273. At Mr. Robert Fowler's sale of Longhorns, at Little Rollright, Oxfordshire, in March, 1791, three bulls, aged 2 years, 5 years, and 2 years, averaged £217 each; three bulls, aged 1 year, averaged £173 each; three cows averaged £203 each; and the 50 lots of bulls, cows, heifers, stocks, yearlings, and sucking calves, averaged £85 2s. 3d. each: with a total of £4,255 13s. "At Mr. Prinsep's sale, at Croxall, in September, 1811, the following prices were realised: four bulls averaged £120 15s.; one bull calf, 8 months old, £168; three cows, £217. The 65 lots of bulls, cows, heifers, cow and bull calves, averaged £60 11s. 2½d. each; or total, £3,936 9s. At Mr. Paget's sale, at Ibstock, in 1793, a bull named Shakespeare, bred by Mr. Fowler, of Rollright, fetched £420. The fact is, that the breeders of Longhorns half a century ago cultivated a wrong type of animal—one that was deficient in muscle, stamina, and the general characteristics of a good constitution. They set more store by a showy hip and rump than by a good fore-quarter and milking or cheese-making properties. The error has been some time perceived, and the breeders of the present day have been cultivating those more useful properties which the Longhorns possessed at an earlier period; and, as far as we can see, they are likely to be successful in attaining their former position. We find there is a general inquiry for all the cow calves that the present breeders have to spare. As to butter and cheese, it has been quaintly, and we believe truly, said, that 'you can skim the cream from the milk of the Shorthorn with a feather, but that a mouse can run, without danger, on the cream of the milk produced from a Longhorn.'

No doubt there are bad Longhorns as well as bad Shorthorns, but the great prejudice that has arisen against the former is in consequence of 'this hip, rump, and no-milk mania,' which had the sway in preference to good roomy frames, unmistakable constitution, and good milking properties, and having lost these latter requisites it was very difficult to regain them. Some herds were broken up, because of barrenness and casting calf, which events will happen to any breed. Early maturity is doubtless of great importance to breeders, who sell their young stock; but with dairy farmers who breed only about the number required for their own use, a few months is not of that consequence, and the more so when this is counterbalanced by the cows wearing a greater number of years. It is in some places almost a proverb, 'as old as a Longhorn cow,' in speaking of the age of stock, many of them remaining useful for a long period, and we much question if the Longhorns were forced from early birth as most of the best Shorthorns are a course which we strongly advise the Longhorn breeders not to follow, if there would be much difference in this early maturity in these breeds. We the more strongly say this, because we have heard of a Shorthorn breeder whose herd has ranked high for pedigree, who made a Longhorn friend a present of two beautiful Shorthorn cow calves, with the understanding that they were to be reared with the Longhorns, and also with the prophecy that, 'they would soon replace the old bygone Longhorns, which were only fit for a menagerie or the British Museum.' The result, however, did not show much difference, but while the Shorthorns made good heifers, the early maturity contended for was not very apparent. A cross between the two breeds has been found preferable to the original Longhorn, and a dairy of the pure breed is now rarely to be found. But they possess many valuable qualities both for the butcher and grazier;—the fine tapering shoulder covered with flesh, being rarely found in any other animal, while the great length of back affords more valuable cuts than in other breeds, and the entire carcass possesses much symmetry and fulness of form. For the pail or suckling, the Longhorns are much celebrated."

PLATE IV.

OVER THE VALE.

Over the Vale signifies the Vale of Aylesbury, and our print gives the end of a run with Baron Rothschild's stag-hounds. The Rothschilds have now fairly settled down in Buckinghamshire, where they do a deal of good; keeping a thorough-bred stallion for the use of the farmers, liberally supporting the agricultural societies of the district, and themselves already distinguished for the prac-

tices of improved husbandry and the breeding of famous stock. At the recent Royal Meeting at Worcester, Sir Anthony took the first prize for the best bull calf in the Shorthorn section, as well as receiving sundry other commendations for his entries. The hunting establishment at Mentmore is maintained in great style, and the hounds are very popular alike with the proprietors and the tenantry.



Over the Water

London: Published by Rogers and Pascoe, 246 Strand 1863

J. Corrie

OUR MOUNTAIN FARMS.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

The south country farmer, who directs his holiday wanderings to "the lake district" of our island, will derive no little pleasure from his visit. It was during September of the present year that I encamped for some days at Portinscale on Derwentwater; and during that time I was again impressed with the many comforts and advantages enjoyed by the inhabitants of that deeply-interesting portion of our island. The cleanliness and neatness of their houses—the open, manly bearing of all classes—the kindness with which they greet you, can hardly escape the attention of the visitor. The men are very commonly above the middle height, and the agricultural labourers are chiefly shepherds, since there is little corn (chiefly oats) grown in these mountain farms. Indeed, although in Southern England wheat may be profitably cultivated at 600 feet about the sea, yet in Cumberland, owing to the considerable moisture of the climate, 400 feet may be regarded as the maximum height. Barley, however, is cultivated up to 600 feet, and oats, in some cases, as high as 800 feet about the sea.

We who dwell in level counties, such as Surrey, whose highest elevation (Leith Hill) is under 1,000 feet; or in the eastern counties, where from 500 to 600 feet is deemed a very considerable elevation, are hardly able to understand the difficulties of such mountain cultivation. Around the lake of Derwentwater, for instance, there is Grisedale Pike 2,684 feet, Saddleback 2,889 feet, Helvellyn 3,055 feet, Skiddaw 3,022 feet, and Scawfell Pikes 3,166 feet above the sea level.

Upon these cold mountain ranges the westerly breezes bring the vapours of the Atlantic, where they are condensed, and pour down copious showers at most seasons of the year. The rainfall is, in fact, more considerable amongst these mountains than in any other part of England. For instance, in three years at I. Crummock Lake, 260 feet above the sea, II. in Borrowdale, 368 feet, III. at Keswick, 358 feet above the sea, there fell in the years 1849, '50, and '51 the following depths of rain:—

	I.	II.	III.
	Inches.	Inches.	Inches.
1849	70.21	125.47	48.80
1850	85.66	143.96	59.52
1851	84.08	139.60	62.33

The table land on which the mountain ranges of this district are placed is considerably raised above the sea. The altitude of the surface of its lovely lakes and tarns, which are found at the lowest part of the Cumberland valleys, shows at what great elevations many of the farmers of this romantic district have to cultivate their lands. Thus, the surface of Derwentwater is 222 feet above the sea, Crummockwater 240 feet, Buttermere 247 feet, Ullswater 380 feet, Haweswater 443 feet, and Thirlmere 473 feet. The level, indeed, of some of the smaller Cumberland lakes or tarns occurs far above the limits of cultivation. Thus, Sprinkling Tarn, in Borrowdale, is found at 1,900 feet above the sea; Red Tarn on Helvellyn at 2,400 feet. The wildness and rockiness of the scenery around these upland waters, where the mountain sheep are still found, may well interest the pilgrims from our level, warmer, and drier southern counties.

The moist climate of these elevated lands naturally retards the ripening of the corn. When I was in Cum-

berland, in September of this year, though it was so generally a forward harvest, there was by far the greatest portion of the oat crop still unharvested, much not even cut, and some still green. The lateness of their harvests at considerable elevations has been well described by Mr. William Dickenson in his prize essay on the Farming of Cumberland (*Jour. Roy. Ag. Soc.*, vol. xiii. p. 217), when alluding to the cultivation of the high grounds of Castle Sowerby and of Hutton Moor, from 800 to 1,000 feet above the sea, where seldom any grain except oats is grown. This crop, he observes, is sometimes cut amid showers of snow or hail, and the grouse are often known to come down from the mountains, and feed upon the stocks of oats on Hutton Moor, during snow. There is another tract of hill land, comprising the farms of Snow-hill and Bolton Park, where oats and turnips are occasionally cultivated to a considerable extent, by way of renewing and improving the land for pasturage. This land, at an elevation of 800 to 900 feet is a free loam, resting on the carboniferous limestone. The soil usually produces a considerable bulk of oat-straw, and in good seasons a fair return of grain; but in late seasons it is often cut in a green worthless state, even as late as November.

I have already alluded to the lateness of the corn harvest in the Lake district in the September of the present year; and in proceeding thence *via* Penrith to the Banks of the Clyde, the proportion of the corn in the fields increased very considerably, and during the last fortnight of September, daily heavy rains quite prevented the ingathering of the corn. A field of oats, in sheaf on our arrival at Dunoon, in the middle of September, was still on the ground on the last day of the month. The little farmers of that part of Argyshire have a good mode of hooding the oats, by covering the stocks with reversed sheaves. This crop, the southern reader must remember, is, in the north of our island, of such a vigorous growth, that there is no difficulty in making it into sheaves.

We are all aware, as Mr. Dickenson remarks, that the principal effect of elevation on the produce of the earth is to retard its vegetation in the spring, and to shorten the period of its summer growth. The average of about 600 feet above the sea-level is the highest elevation at which wheat can be profitably grown in England. But in most parts of Cumberland the culture of wheat ceases at a little above 500 feet, and in some parts much below that height. In the southern part of the country, where the distance is short from the mountains to the sea, and the crops exposed to the fury of the south-westerly gales, wheat is rarely attempted to be grown even as high as 400 feet. At any greater elevation the storms which usually occur in June, July, or August sometimes renders the whole crop nearly worthless, and on the lower levels it often happens that much harm is done by what the inhabitants call the "sea blast." These blasts of wind seriously injure the crops of corn, loosening their roots, and, if the grain is nearly ripe, beating out the earliest and best portions; and it is no unusual thing, after the occurrence of these winds, to find the stretches on the lighter soils levelled, and the turnips blown entirely out of the soil. This frequently occurs on the light soils of the exposed coast from The Duddon to St. Bees.

The hay harvest in the Lake district was hardly concluded in September. The greater part of the meadow hay is

secured in August; for, observes Mr. Dickenson, it would seem almost in vain to struggle with the customary rains of July, on the western or "wet side" of England, in hay-making, with a fall of rain in that month amounting, in most years, to more than falls in the other summer months.

A large proportion of the smaller Cumberland farmers, such as those of the mountain vales and along the western bases of The Fells, in a great measure depend on their meadow hay for the winter support of their cattle; and when a wet hay harvest occurs, which is not unfrequently the case, the crops of meadow hay are so injured by long exposure to the weather as to be of little value as fodder, and the cattle suffer accordingly.

The difficulties under which these little mountain farmers labour in gathering in their hay is, indeed, very considerable. Many of the meadows, which are not unfrequently flooded, produce hay having a sickly or fishy scent; and this, continues Mr. Dickenson, the cattle do not relish or thrive upon. Then, again, there is still much to be done in improving the herbage of the Cumberland pastures by drainage; from neglecting this, there are far more rushes to be found in them than is desirable. Some of the coarser meadows which produce many rushes, intermixed with grasses of poor quality, are noted, in the homely Cumberland phrase, as producing "lousy hay"—that is, hay on which cattle deteriorate in quality, and become tenanted with vermin.

From the abundance of rain, and the scarcity of thatching straw, the farmer is here glad to carry his hay either into barns or under hay sheds, which is merely a permanent roof supported on posts. It is from this absence of straw that the ferns with which the mountain sides are covered are very commonly gathered in for fodder. They are mown, allowed to dry, brought on sledges down the steeper inclines, and then carted to the homestead, where they make excellent bedding for stock.

As might, then, be anticipated, the climate of the Lake district is much in favour of pasturage. The produce of their meadows is excellent, and their extensive hill sides are tenanted with a little race of sheep, called the Herdwick—small, handsome, active, and hardy. This breed is stated, says Mr. Dickinson, to have sprung from a few which escaped from a Spanish ship wrecked on the coast; and these having established themselves on The Fells were found to thrive and enjoy the locality, and since then, from having been farmed out in *herds*, thence acquired their name. They occupy the range of mountains from Wythop to Black Comb. The majority are without horns, and their legs and faces are grey or mottled. Where care is taken in selecting and breeding, the nose is of a lighter grey, and is then termed "rimy," from its resemblance to hoar frost.

Except the lambs (which are dispersed over the arable farms during the first winter till Lady-day), the Herdwicks are kept on the mountains at nearly all seasons. The wethers are sold for feeding at four or five years old, and weigh from twelve to fourteen pounds per quarter, the ewes from eight to ten pounds. The mutton is excellent.

A stronger and rather larger variety of the Herdwicks are found around Derwentwater. They inhabit Skiddaw, the Caldbeck group, the Helvellyn range, and the adjoining mountains. They are foddered on their feeding-grounds in winter with hay, whenever the winds will admit, and they well know the appearance of the hay-sheaf and the shepherd's call.

There is, perhaps, no other breed of sheep with which our country is tenanted that is able to endure the hardships of these little mountaineers. It was near the highest point of Griadale Pike (2,684 feet above the sea) that I found a few of these little fellows browsing on the heather—the coarse moss and equally innutritious grasses which

alone vegetate in this region of storms and low temperature. From the place where these were browsing, a noble view lay before us over half Cumberland—across Solway Firth on to the mountains of glorious old Scotland, at a distance of at least twenty-five miles. Subsisting, then, on such wild and elevated pastures during the severest winters, we need hardly feel surprised that even these hardy Herdwicks suffer. This is shown after heavy rains in spring and winter, adds Mr. Dickinson, by the wool of the fleeces turning almost black, as if drenched with soot and water. This discolouring of the wool is an indication of the sheep having sustained a sudden and severe check in their thriving. As the weather improves, the blackness goes off, and the fleece resumes its natural colour.

The active habits of these mountain sheep rather surprise the owners of lowland flocks. The fields of the mountain farms are divided by stone walls raised without any mortar or other cement to the height of five or six feet; and yet so readily do these Herdwicks leap on to and over these walls, that the shepherd is wont to fasten horizontally the rough stems of young larch along the tops of the walls, to prevent them bounding over.

Professor Low and Mr. Spooner ("Hist. of Sheep," p. 26) have well described the blackfaced heath sheep of this district as of the smaller races, with respect to the weight at which it arrives, but larger and more robust than the Shetland, the Welsh, and the ancient soft-wooled sheep which it displaced; it somewhat resembles the Wallachian, which has an affinity with the Persian. Both male and female have horns, their limbs lengthy and muscular, the general form robust. The fur is shaggy, and the wool coarse; this is of medium quality, and weighs, when washed, about three pounds the fleece. Although wild and independent in their habits, they are not so restless as the mountain sheep of Wales. The ordinary weight of the wethers at four years old is about fifteen pounds the quarter, but this is increased when they are from an early age sufficiently fed. The mutton, if not so delicate as that from the Welsh or Southdown, is more juicy, with more of the venison flavour, and is preferred to every other by many persons.

The mothers are hardy nurses, are able to bring up their young even when under great privations. They are so managed that they do not usually drop their lambs till the season is open and mild—a very essential point in their exposed and bleak pastures, where it not unfrequently happens that many are overwhelmed and killed by severe falls of snow. A great defect of this breed is the fleece, which, besides being thin on the body, yields wool fit only for the manufacture of the coarser stuffs.

It is impossible to see these hardy race of sheep, climbing amidst the highest rocks and most elevated peaks, without being impressed with the sagacity and value of the shepherd's dog—which attends upon them, regulates their wanderings, and, when ordered, gathers them together. He here acts, as Dickenson remarks, a very prominent part, more especially in winter, in frost and snow, when hundreds of acres which the shepherd ought daily to inspect may be so slippery and dangerous as to greatly limit his excursions. Though at all times his services are indispensable, at such periods of frost and snow the dog will do the work of twenty persons, in patiently bringing down the sheep from places almost inaccessible at any time to the shepherd.

These dogs bear little resemblance to the black dwarf-tailed sheep dogs of our southern counties. They are more commonly of a brownish colour, with streaks of white; have long tails and sharp noses, with a look of the wolf about their faces. They are intelligent and sagacious—these good qualities of course varying in different dogs, and, as a natural result, their ordinary money value ranges from 30s. to 40s.; but some dogs are too highly valued by their owners, to be parted with. A sheep, or

even a cow, has been refused when offered for a first-rate shepherd's dog. Indeed, no shepherd of standing, adds the reporter I have quoted, will dispose of his favourite on any terms; and even when broken down by adversity, his dog is the last chattel the storms of life compel a feeling man to part with, and then not without evident sorrow.

To the reader who wishes to see the primitive farming of the district round Derwentwater, I would say, go to Penrith, and thence to Keswick, by rail (the Penrith and Keswick railway will be open in the next spring). Lodge at Portinscale, on the banks of Derwentwater, at Richard Knibley's, who will lend him his boat to row on this

lovely lake, and his carriage and horses to drive around it; and when he comes home with an appetite by no means the worse from breathing the mountain air of Skiddaw, Mrs. Knibley will have ready for him some Cumberland mutton, which will bear comparison in flavour and tenderness with far fatter and larger joints; he will then feel as Goldsmith did on a similar occasion, when he wrote—

"Thanks, my lord, for the haunch;
For a finer or fatter
Ne'er ranged in a park,
Nor smoked on a platter."

THE HERDS OF GREAT BRITAIN.

CHAPTER XLI.

THE WESTONBURY AND MONAUGHTY.

A ramble into Radnorshire on a long summer day, while Worcester was burnishing up her banners, and the "Royalists" were closing their ranks, formed our pleasant prelude to the Show week of 'Sixty-three. Westonbury was our starting point and Monaughty our goal. The history of the one is virtually the history of the other; and the great key-note of both is Sir Benjamin. He was bred by Mr. "Ben Rogers," of The Grove, who thus enjoys the honour of knighthood by proxy (which is better than what our forefathers dubbed a "Peg Nicholson Knight"), and "by Sir David (349) from Pretty Maid by Young Royal 2nd (1469)" is his entry with the Registrar-General of Herefords, at Baysham Court. We had read of him and seen his picture, but we had never met him in a show-yard, and there was now alas! nothing left of him but a grand ruin. Mr. Thomas Rea, junior, bought him the year he came to Westonbury, used him for three-and-a-half seasons, and had about twenty-five calves a-year by him, and then he was passed over to Monaughty. His bulk was always remarkable, as, before he was three years old, he girthed 9 ft. 6 in., and at one time scaled about 24 cwt. At the Chester Royal, where he went as a two-year-old into the aged class, which was won by Mr. Price's Goldfinder 2nd, Lord Bateman's Carlisle was third to him and Lord Berwick's Severn commended. He met both Carlisle and Severn with the same result in the £42 sweepstakes at Ludlow (where he also stood first with four calves to back him); and among his £156 of prize money must be reckoned two "bull, cow, and offspring" prizes, with Lucy by his side, at Hereford and Leominster. He was at the Canterbury Royal very low in flesh, and was passed unnoticed; but three months wrought a wondrous change, and he completely avenged himself at Hereford. Sir Thomas (2228), whose get won two firsts and a second at the Worcester Royal, is the produce of one of four heifers which Mr. Roberts sent to him, and his sons Mr. Arkwright's Sir Oliver 2nd and Mr. T. Davies's Plato were the first and second in the aged bull class at the same meeting, as Sir Richard and Sylvius had been, two years before, at Leeds.

We looked round the yard for Sylvius, whose breast was deeper than any bull we ever saw, except Mr. Fawkes's Robinson Crusoe; but his place was given up to Artful, and this second Cotmore in bulk had departed about Christmas to the butcher, where his carcase pulled down the scale at 21 score a quarter, leaving only Bella 2nd behind him. Sir Richard had taken his sire's place at Monaughty; but the name still lingered in his old haunts, and among the troop of cats and kittens, which crowded into

the byre for a trencher of milk when "the nursing" time began, we found "Sir Richard and Young Sir Richard, *she* cats both on 'em," while "Old Kitty" and "Peter" each occupied a shoulder, and "Smat" entrenched herself on the head of that eminent feline fancier, Richard Hemmings, the herdsman.

Mr. Rea commenced breeding in 1856, with 10 cows from the Monaughty herd, principally by Regent (891), and 14 heifers by Grenadier (961), and Chieftain (930), for all of which Sir Benjamin proved a most effective cross, and the produce not only fetched good prices at home and abroad, but won in four successive years the bull and four calves, and bull, cow, and offspring-sweepstakes at Ludlow, Leominster, and Hereford. The Chieftain cross hit well with Lucy and Kate, and the two Romeos and Sambo and his own sister Kate 2nd are no mean proofs of it. The latter and Artful (by England's Glory from Spot 2nd), and therefore a grandson of Sir Benjamin, were off to try conclusions at Worcester, and when we had taken a peep at the calf-house, which only contained a Lord Nelson bull-calf from Beautiful, a Chieftain heifer from Sister to Sir Richard, and the first of the Artfuls from a daughter of Bella—both of the latter born before their time—we quietly strolled a-field.

The farm at Westonbury, which is about 1½ miles from Pembridge and fourteen from Monaughty, is held under Edward Coates, Esq., and consists of about 315 acres of deep loam. It is on a clay subsoil, and grows good wheat, roots, and beans; but is not suitable for barley and oats. A range of hills faces it on the N. and N.W. Beginning in the far distance with Shobdon, the eye glances along them past the church tower of Stanton, on the Arrow, Coombes Wood (that neutral cover of the Ludlow and the United), Nash lime rocks, above the home of Lady Langdale, at Eywood, to the summit of Knill Garroway, where three yews stand in mournful fellowship, to mark the limits of three parishes; and then miles away into the heart of Radnorshire, over Kington Hollow and Hergest Ridge. The flock consists of about 70 ewes, a cross between the Leicester and Ryeland, which are crossed again with Ryeland tups, from Mr. Downing's, of Holme Lacy. Mr. Rea tried Shrops and Southdowns at first; but he had to adopt the native sheep, as the foreigners were more liable to foot-rot, and did not bear the cold so well. The late Mr. Rea found the Shrop and mountain cross not hardy enough for the hill, and he, too, fell back on the Ryeland. Of this breed, which was hardly represented in sufficient numbers to give it the prominence it deserved at Worcester, a well-known Herefordshire farmer thus writes us:—

"The rotundity of their bodies, their thick scrags, the

fulness of their chest, and shortness of legs, bespeak them to be a hardy race of animals. Their wool is fine and remarkably thick, and covers the whole body from the nostril to the foot. There is great peculiarity in their appearance, from the large bushy topknot, which is generally so full that the animal's eyes are obscured from view. The mutton is much sought after, as there is an abundance of flesh, and it is highly esteemed at Malvern for its fine quality by all who visit that lovely spot. They are the indigenous breed of the neighbouring county of Hereford, and some half a century ago were as general as the 'white faces.' The wool was held in such high repute that it supplied one of the 'five W's,' for which the county's fame was renowned some centuries back. In the latter part of the past and the early part of the present century, that great pioneer in cattle breeding, the late Mr. Tomkins, was also highly celebrated for his Ryeland flock. At that period sheep were little thought of, and, owing to the utter want of provision for the severity of winter (no swedes or turnips being grown) they did not improve in the same ratio as the sheep of other breeds in more highly farmed districts.

Gradually, as cultivation improved, more attention was paid to them, and, in order to increase their size, and also the weight of wool, the improved Leicester was resorted to. The success of the cross was very marked, and the Ryeland was superseded upon nearly all the dry sheep soils of the county. Since the days of Mr. Tomkins, the late Mr. Jauncey, of Mathon near Ledbury, may be perhaps noticed as one of the most successful and determined breeders of the pure Ryeland, and amongst the breeders of the present day Mr. Downing, of Holme Lacy, near Hereford, has one of the largest and best flocks. His sheep won each of the prizes offered at the Royal Agricultural Society of England. He generally beats the Shrope, or divides the short-wool honours with them at Hereford, and his wool last year gained an honourable mention at the International Exhibition. His average clip last year was, he assured me, 8½ lbs., although he shears his lambs, and therefore has no tegs. He has fed 2½-year-old wethers for Christmas up to 42 lbs. per qr., and this year he realised 28d. per lb. for his wool. There are many other pure bred flocks in the county, particularly in the woodland and heavy soil districts, for which they are peculiarly adapted, their thick fleeces and well-covered bodies and heads bidding defiance to that prevailing pest, the fly. Among other present breeders we may mention Mr. Taylor, of Showle Court; Mr. Taylor, Holmer; Mr. Arkwright, Hampton Court; Mr. Ballard, Leighton Court; Mr. McCann, Malvern; Mr. Pinches, Pembridge, &c., &c. It is said by those best able to judge that such is the peculiarity of the soil and climate of the county, that no matter what the breed of sheep is that may be imported into it, they soon degenerate, and yearly approximate nearer and nearer to the Ryeland. This I can vouch for with the Cotswold."

We looked at some of the young heifers on our way to the Water Stones, and espied one by Sir Richard from Spot 3rd, and good to tell from the likeness to her sire, and the best of the Lord Nelsons (half-brother to Price's Salisbury), from Cherry 2nd, Eva by Regent, the dam of Westonbury, the Sir Oliver, and Sir Cornwall by Sir Benjamin, was one of the crack matrons of this meadow, with her rather upstanding horn, daring look, and beautifully-dappled skin, in which her winning son at Worcester closely resembles her. She was only once shown, and won with five other cows in a lot at Hereford; and her half-sister Cherry by Regent, and her daughter Bella by Grenadier, are always together, like Col. Towneley's three mares—Haricot, Honey Dew, and Nelly Hill—at the Whitewell Paddocks. Cherry is plain about her rumps; and this is rather the fault of Bella, who is a very grand cloggy cow

of wondrous substance, but not of remarkable elegance. At the Chester Royal she stood first among the in-calf heifers, and made up her double first in the cow class at Warwick the next year, when the Hereford men were not slow to note that she girthed three inches more than Mr. Stratton's shorthorn winner. In all she has won about £64; the flesh which was put on during her training never seems to leave her; and it is on her's and the Lucy tribes that Mr. Rea principally relies. She has had three heifer calves by Sylvius and Lord Nelson, and recently by Sylvius, and is now in-calf to Bolingbroke (1883). Her saddest mischance was when she slipped twin bulls to Sir Benjamin, who is well represented among her companions here by Cherry 2nd, Plum, and Spot 4th.

In the Bury orchard we found quite a levée, beginning with the nice, short-legged Lucy by Chieftain, from Fair Maid by Regent, and her good and compact Sambo daughter Lucy 3rd paying her most dutiful attentions. Lucy is the most fertile of matrons, and the dam of four Lucys, as beginning at two she had scored six calves, when she was as many summers old. Besides making one of a winning six at Hereford, and one of four ditto at Ludlow, she completed the Herefordshire "grand tour" by winning along with Lucy 2nd and Sir Benjamin in a family trio at Leominster. She was equally lucky with her mate at Hereford; and Romeo "the little five months' encumbrance" that day, was sold at a very high sum, to go to Australia, which has formed along with Jamaica a considerable outlet for the white faces of Westonbury. The thick, heavy-fleshed Gaiety by Sambo was also in the throng, and so was the big, good Minnie by Sir Benjamin, Dowager by Chieftain, whom Mr. Rea had used for three seasons in all, and twice bought and sold, beginning with him as a calf at 50 guineas, direct from Stedman, of Bedstone, his breeder. We must not forget the neat but sparky Whitfield heifer Woodlark, and Beautiful by Sir Benjamin from Beauty 4th, who had eleven half-sisters there by the old bull. Among them, we liked few better than Isabel 2nd, from Isabel by Chieftain, and, from her length, scale, and character, if she had not slipped her calf, she would have "gone on" for Worcester, instead of her half-sister Kate 2nd, which was second in her class. The Chieftain cows have pleased Mr. Rea so much that he gets the cross the other way; and he and Mr. Monkhouse (who was much taken with Artful's touch) have sent to each other's bulls. Primrose 2nd, an own sister to Sir Richard, was in-calf to the old bull; and her dam Primrose, by Glendower, son of Regent, still looked well, and so like Sir Richard in her middle-piece that it was almost impossible to mistake her if you had been told to point her out from a score.

"Good-bye, Sir Benjamin," and so we quitted the county, whose cider is said to be so conducive to Old Parrism, that eight men, averaging a century a-piece, once executed a morris dance at a harvest-home. We thought of "those venerable buffers" as we passed the end of the elm avenue leading to Moor Court, with its quaint gable ends and black cross garters half-hid among the apple-boughs. It was here that "Tom Jeffreys" lived in the days of Cotmore; and here, too, that Mr. Rea, senior, came on his mission for Regulator. That rare judge from Monaughty had been a breeder for nearly fifty years, and delighted to trace his herd tap-root to Crabstock, with "his deep flesh and capital hair." He was steady in his heart to the white faces, but still he used Parry's Old Court, despite the spot in the centre. In 1816 he began with a Knight's white bull Snowball, which was also used by Yeld of the Broom, in the days when greys, whites, and mottle-faces were having their run, and Charity, Sovereign, Cotmore, and Lottery had not made their Jeffreys mark. Taylor's Crabstock (808), Weyman's Noble

(238) and Retriever (367), Bowen's Duke (304), Hewer's Sovereign blood in Jeffrey's Confidence (367), and Albert (330); and Roger's Gallant (239), by a son of Charity, were all on the white-face side of the house at Monaghty; and Old Court, and Monaghty, bred by himself, and tracing through his sire Old Court (whom he much resembled), Duke, and Regulator back to Crabstock—were his principal mottle-faced champions. "Quality and hair," as he used to say, "came with Snowball, Crabstock, and Retriever; I got regularly into the white faces with Regulator and The Duke." The Duke was one of the heavy-weights, and his owner lived to recount how he won nine prizes in one day at Clifrow, with bullocks and heifers, by him and Old Court; and how a four-year-old heifer by the former died well at 18 score 18 lbs. a quarter. In his day Mr. Rea won more than 200 prizes, and yet he never showed at the Royal until 1854, where he won, in the yearling class with Tom-o'-Lincoln. He had never but one sale in his life, when the average was £30 for 70 cows in calf or with calves at their foot, and he bought in Sir Benjamin at the 150-guinea reserve. The bull was sent straight off that night, and won the first prize at Hereford, and there will be about 90 of his get at the sale this month. After the first sale he was used to the heifers by Wellington from Cholstrey, Regent, Grenadier, Chieftain, and Balacava cows, of which there were, counting calves and yearlings, about 50 left. For Carpenter's blood Mr. Rea had also a peculiar fondness, and three out of the five heifers he got from him were Eva, Cherry, and Spot 2nd.

Such was the programme of what we had to see at Monaghty, and on we pushed, not by the regular way, but round by New Radnor. To our left was Burley, a bold continuation of Dinmore Hill, and the ridge of the Black Mountains right away to Hay and Abergavenny. Do what we might, we never could get rid of an ancient tramway which carries lime and coal and gravel, and all manner of mineral treasures, by the aid of divers donkeys, and runs through little special lanes of its own, all radiant with honeysuckles and dog-roses. Woe betide the unhappy avain who takes a lover's walk down one of them with a nymph in crinoline! Two or three harriers were wandering about Kington, that town of "Old Burgess Lewis" and the new "Perseverance Works"; but we think of their nobler brethren as we near the limestone rocks of Stanner, on which nearly all the road commissioners in three counties depend for ballast, and our companion begins to tell us of the late Robert Luther and the days when they rode side by side. Stanner Rocks, with its platforms half-hidden with fern and scrubby oaks, can find few meets, if any, to match it for beauty, in the three kingdoms. Worsel Hill, rises just opposite to it, like a green sugar-loaf, and Robert Luther's cheer and finding note on his horn was loud enough to wake the echoes at Llanneilen's Pool, or penetrate the badger runs of Llanarth. We think, too, as the shadows come and go, and chase each other from Wimble Height and over the bleak Radnor Forest, how his Whig comrades so lately followed, when scarcely fifty summers had passed over his head, the deepest thinker and the most sterling politician of the younger school to his rest, and laid him among his kindred, under that embattled tower on the quiet hill-side. Then we cross the Lugg, which pursued its sparkling way down to Presteign; and shaded so thickly by ori-trees that the fisher can hardly cast his fly. Rich is the old pasture in the Newhouse meadows, and, on we go to the left, leaving the little assize town of Presteign (where Mr. Baron Wilde had just received his white gloves), past divers dingles, and then by Pilleth Church. The gorse of that ilk which Luther loved so well is above our heads, at the top of the sheep-walk; and over the valley in which the whitefaces of

Monaghty are grazing is the Forest Wood, stretching away in the mist for miles.

Monaghty (or "Monk's House") is so called from the circumstance of the last abbot of Abbey Cwm Hir coming there with a body of Cistercian monks when the monasteries were dissolved, and maintaining privately the old habits and religion of his order. We don't say so; but some guide-book or gazetteer does, and of course we felt bound to consult it. It is a curious old place, with a little ex-dungeon leading out of the entrance-hall, which is now adorned with pictures of Cotmore and a fat ox. Then there is a great hall, which has bucklers and spears on its walls—and a much more sensible adornment in a picture of Smithfield market. There, too, are Countess (half-sister to that Winifred by Monaghty, whom Mr. Monkhous loves so dearly) and Crink, the unbeaten winner of seven prizes, with the Old Court spots on the feet. Of course the old bull is there, and so are Duke, Regent, Tom O'Lincoln, Silurian (bred here and sold a calf), Csarina, and Verbena, and the Short Tail cow (what numbers hang on to that stump!) whose sire was bred by the late Mr. Rea, and whose likeness meets us in Herefordshire as often as does Mr. Samuel Warren's, Q.C., in the photograph shops of the metropolis.

The farm, which is in Bleddda parish, and the property of Mr. Green Price, M.P., Sir Cornewall Lewis's successor in the New Radnor Boroughs, has 600 acres enclosed land out of 1,100 principally on gravel, along the banks of the Lugg. The late Mr. Rea came to it in '28, from a farm of his father's near Knighton, and there he died at the age of sixty-four, in the spring of the present year.

Sir Richard was the only occupant of the bull-shed, in which Grenadier (961) by Young Conrad (2322) out of Venus 4th from Winifred, died after two seasons, and Mr. Rea said, in his anguish, when he saw what Bella and the other heifers were like, that he "would rather have lost £500." The present tenant is a very nice-sized bull, and the style in which he beat all the Canterbury yearlings at Leeds, and repeated the dose at Hereford, shows what the bench thought of him in his Ring prime. After a word with him, we passed down a sort of fir-tree dell with the high sheep-walk of Glog to our left, on which five hundred three and four-year old grey and tan-faced mountain wethers, slightly crossed with Ryeland, were busy among the heather and bracken. In the first pasture we found fifteen cows and calves; all of the latter, save two, by Sir Benjamin. Among the more noticeable cows were Ringlet of the Grenadier and Chieftain blood, and Sultana, a very pretty short-legged one of the same blood, and from Chieftain's dam. Ringlet 2nd was one of three Wellingtons—to wit, Rose of the Valley from Lily of the Valley by Regent, and Damask Rose from a Grenadier dam. Emerald by Treasurer (1105) had a remarkably good heifer calf by Sir Benjamin, and Sylph by Sir Benjamin, an equally good one by Baron of Boultonbrook. The big, brown-eyed, heavy-fleshed Melody by Balacava (a son of Big Ben), and from a daughter of Eva's, might have walked out of a fat picture. With no very fertile prophecy about her, we crossed the Lugg at the water-mill, and into the Bellean. Among its twenty-one cows were three more of Balacava's—Eglantine, Csarina, and Duchess of York—similarly marked round the eyes. There, too, were the stylish Blue Bell by Revenge, the thick Nosegay, Prospect of the Wellington and Grenadier blood, and with a prospect of doing it more justice yet, the somewhat sparky Cornflower by Wellington, and her half-sister Grace the Second; the mottle-coated Becky from Lord Berwick's, and a little slovenly at her rump end; the good Sunflower by Grenadier, which broke her horn when she was sold to Australia, and was taken back in consequence; Fancy, the only Westonbury left in the

two herds; and Sweetbriar by Wellington, from Grenadier's dam. Diana 2nd and Spangle 2nd were away taking a first as a pair at Worcester. In Dollo Court there were nearly twenty young things, all by Sir Benjamin. We were less pleased there, and our pencil became busier in the Long Meadow. There we had indeed a treat among the steers, cows, and calves—and the first of the three will hold their own well among the 144 lots on the 22nd. There we found Picture by Grenadier, a rare, gallant steer

from her by Wellington, and a bull calf by Sir Benjamin (whose brother Zippor was purchased by Mr. Duckham for Messrs. Davey and Redrush, in Cornwall); Silver and her good Wellington bullock; Ringdove, and her Sir Benjamin calf. It was well to close with steers, that peculiar glory of the Hereford men; and so good-bye to Monaughty and the white-faces till (D.V.) two more summers have passed over our head.

H. H. D.

THE RAM WITH THE EWES.

The time for putting the ewes to the tup does not vary much throughout the kingdom. It is from the middle of September to the middle of October for the general flock; but for fat lamb it is often much earlier, particularly in some of the southern counties. Many ram-breeders will also attempt breeding early lambs. It is attended with many difficulties; but should a successful issue be the case, then that successful breeder's shearings will generally make large prices in the autumn, owing to enhanced or forced maturity. The subsequent management of the ewe flock, and the getting up the lambs either for market as fat lambs or for sale as shearing lambs, must be of the most careful, generous, and expensive kind, or failure will certainly be the result. For the fat-lamb trade (as in Dorsetshire) the bulk of the earliest lambs are what is termed "house-lamb," and they are often got up to extraordinary size, even before Christmas. This is, of course, a separate business, and is entirely different to common breeding. The ram is put to these fat-lamb breeding ewes in the summer and early autumn, and many of them will breed twice within the year, under proper and careful management. This is mainly induced by permitting the ram to associate with the ewes a week or two after lambing; some are thus teased into taking him. The ordinary breeders of fat-lamb devise many schemes to ensure a profit. Early tupping is one means. Southdown ewes are procured, and being put to large long-woolled rams, is another: this is to ensure size and early maturity, the ewe being supposed to suckle her lambs much better than the long-woolled ewe. Others will take the directly opposite course, particularly the breeders in the colder districts. They put a short-woolled ram to long-woolled ewes. In any and every case which experience has proved to be most desirable, it will be necessary to give the most nourishing and healthy kinds of food, and to keep the lambs dry and warm. For this purpose warm fold-yards and well-sheltered paddocks, with plenty of covered shelters, are very conducive to rapid progress. All the profit depends upon correct management.

But my object was not to write upon breeding for fat-lamb, but for the ordinary flock. I cannot offer anything new upon the subject; but as it is highly important to secure the due serving of the ewes, and a good crop of lambs, it may not be amiss again to recur to it. I know of but few things in business more provoking and trying to a breeder than to find that after he has taken every pains to select a suitable ram, and put him to his choice flock of ewes, they are not only repeatedly "going over again," but ultimately very few of them prove in-lamb. This is too often the case, and is the result, I must say, of great negligence and mismanagement. The ram ought by no means to bear all the blame. The flock-master ought to know pretty early if the ram is doing his rode satisfactorily or not. If he is surrounded by ewes, and takes but little notice of them, be assured something is wrong. If he jumps them over and over again without tupping

them he is not doing right. If he appears to complete his work, and still his ewes return to him in about three weeks, then the flock-master need not longer hesitate, but at once procure another ram. It is to no purpose to suppose a second tupping will suffice. It certainly may do, supposing the shepherd has carefully marked the first-served ones, and noticed that the ram had an unusual number to serve at one time; but it is unsafe to trust to a second tupping, except in such a case. Far better to procure another ram to help the selected one. Besides, it is probable a ewe may hold safely by one ram and not by the other. I sometimes change my rams on that footing alone. I prefer taking away all the ewes tupped within the first fourteen days, and putting them to another ram. I am sure the change is good as to the produce or "crop of lambs," if not so correct as to the stock. This will depend upon the similarity or dissimilarity of the selection of the rams, and the assorting of the ewes to their respective sheep by the same flock-master. Should any demerit arise on this ground, the flock-master must look out for one he deems worthy to succeed the doubtful one; and in many cases this is most desirable, for breeders frequently use rams very dissimilar in character and proportions, in order to be more adapted to the extremes in the flock of ewes, and more adapted to correct those extremes, and bring all into one true form and general similarity and character, like "peas in a peck." One great means to procure a good "crop of lambs" is to allow the ewes a full and very generous diet. The ewes should be kept as well as possible immediately prior to tupping, and during the time they are with the ram. It is true that when their lambs are first taken off, they should be kept on bare pasturage, in order to dry up their milk; but as soon as all danger from milk fevers or bad udders has passed away, then the better they are kept the more lambs will be the return. I do not think that cake or corn or dry food would aid much in this way. Good grass, or clovers, or seeds would do well; but nothing is so conducive to promote effective and productive gestation as green coleseed. Turnips are not so useful, and mangolds are detrimental. No kind of food that induces urinary discharges to undue extent must be allowed. Many common practices resorted to by breeders cannot be too much condemned. I have frequently seen large flocks of beautiful ewes, with probably six or eight rams with them, roaming over large extents of wheat stubbles, and picking up a scanty living. The rams, of course, having double work upon their hands fare no better. In other districts I have seen beautiful high-fed rams turned into almost bare stubble-fields with their quota of ewes, and when these were picked over, they have had loads and loads of mangold leaves carried out to them. This is all wrong. In fact, with numbers of breeders the thought is, "Oh! anything will do for the old ewes." Now, anything will *not* do. No department of business pays better than the liberal and proper management of the ewe flock, and that throughout the whole year

If the ewe is well cared for, she will pay in her condition, her fleece, and her produce. The lamb in return being well brought up "is half-wintered," the loss in casualties small, and the yield of wool great and good.

A few words about the tupping season. The precise time for putting the ewes to tup should depend in some measure upon the quantity of keeping upon the farm to be forthcoming in the spring: if short, the tupping season should be delayed a short time; if plentiful, an early tupping season is best. The number of ewes put to a shearing ram should not exceed seventy-five, to a two-shear sheep sixty-five, to a three-shear sheep fifty. Many deviations from these numbers may be quite correct under suitable management. A valuable ram may be so

managed as to tup nearly double these numbers, but it requires constant attention and care. He must be kept in a convenient place. A teaser must be with his ewes. As they are disposed to take him, the shepherd must bring them to him, and hold them while served, and that only once. An interval of sufficient time must intervene before another is put to him, which the shepherd's judgment must dictate. I have known 175 ewes to be thus served with success. The rams should remain with their ewes at least six weeks. It is desirable where each ram has a separate rode to change them at the end of four or five weeks. If ewes still continue to take the ram, the time should be extended. The judgment of the flockmaster must determine these minor matters according to his observations.

ON SECURING THE MANGEL-WURZEL CROP.

The rapid succession in which one department of farm business follows another, in the autumn, makes it a somewhat difficult task to keep pace with the urgency of the occasion. First comes the corn harvest: this, of course, is all-important, and therefore all other operations going on upon the farm are compelled to yield precedence to the ingathering of the grain. Next comes the potato-harvest, if I may so designate it: this in many districts is no ordinary engagement; the thousands of tons to be raised, throughout the country, are surprising, and the rapidity with which they are got into grave on many farms is highly commendable; it is, in fact, the employment of more labour than in the corn-harvest. Before this business is completed, comes on the wheat-seeding, with which every farmer is more or less perplexed as to his best course; he cannot delay his seeding, in suitable weather and a kindly season. The difficulty lies in carrying on both operations at once. But this is not all: he must thrash some seed-corn: he obtained the stock last year on purpose for this year's seeding: what is he to do? Along with this he is further engaged in tilling, scarifying, and otherwise working and preparing his land for the seeding. Much is in a tolerably fit state for sowing; but much more remains to be done, and would be wonderfully benefited by being done. But the mangold crop—what can he do? must he leave it? All cannot be done at once; and if it could, he has still much more to do: all the lands yielding a crop for the last harvest ought to be placed under autumn culture, by which they would receive astonishing advantage. I might go on indefinitely after this fashion, to enumerate all the requirements of the farm in autumn. The great fact is, that the practice of modern agriculture or farming has led to the extraordinary crowding of one department of business upon another in such an imperative manner, that no power usually employed upon the farm can accomplish it. Well, it will be accomplished. We have now a power which is fast laying hold of the sympathy and obtaining the favour of very many of our best farmers, and it comes in most opportunely to lend an efficient hand to bring all the complications of business to bear in good and due order. In fact, modern farming, in its best acceptation, cannot proceed without it. Of course, I allude to steam-cultivation; I do not hesitate to affirm that it will soon become indispensable, particularly on strong soils. By the aid of this power our farms will be undergoing a thorough culture, and at a cheaper rate, whilst all the other operations are proceeding without hindrance. I hail the prospect with great delight and no little enthusiasm. Hurrah for steam-cultivation!

Well, but the harvesting of the mangel-wurzel crop? I like the word *harvesting*, and therefore use it in the

sense of ingathering. The harvesting of the "mangold" crop has of late years become one of the most important farm operations of the year. In the absence of agricultural statistics we cannot form any just estimate of the quantity grown; but judging from the acreage grown in my own immediate district and elsewhere, and the weight produced per acre, I should not be far wrong in estimating our annual produce at many millions of tons, and this from a root scarcely known thirty years ago. In fact, it has become nearly indispensable on every breeding farm where early lambing is established or customary, and is an essential part of farm economy wherever it can be produced with facility. It is only of late years that its exceedingly valuable properties have become known and properly appreciated. On many farms it has become the principal green crop, and its roots are applied to every feeding purpose; cattle and sheep thrive surprisingly upon it under judicious administration; horses are very fond of it, and do well; pigs fatten fast upon it, when it is pulped and mixed with meal. If well harvested and properly secured, it will keep in good condition for many months, and improve in nutritive value up to the later spring months. Good globe mangolds will frequently retain their nutritive quality till after midsummer, and many of our popular exhibitors of prize stock are, at this season, indebted greatly to this excellent property in the root for the more expeditious fattening of their animals. Seeing, then, it is so valuable, every attention and care should be taken to harvest the crop properly. The first object should be to dispose of the leafy produce to the best advantage. It is customary on some farms to pluck them off, and subsequently to plough them in as manure; but in a season like this, when all kinds of food are so valuable, it must be a decided waste, and in all seasons I think the practice bad. The better course is to pluck them, and lead them out to the ewe flock; or, to put upon them drape ewes or crocks without teeth, and thus feed them off without injury to the roots. Aged ewes will fatten upon them, but younger sheep and lambs will suffer from scouring, &c. The quantity of nutritious food contained in the crop of leaves is very considerable, and ought not to be lightly cast aside as manure, although valuable as such an application; but, with due care and management on the part of the grower, they may be made much better use of. I, this year, have three crops to average about seven acres each. On the earliest sown I have had about sixty drape ewes for two or three weeks feeding off the tops, and they have so far succeeded as to leave little else than stalks, which we shall pull off, and secure the roots next week. The ewes will be removed to the next lot, and, when the bulk of the leaves are eaten, we shall secure them, and so

with the last. The breeding flock will be turned in immediately the fields are cleared of roots, to pick up remaining leaves, &c. In this way we husband a good deal of serviceable food, and are enabled to take up the roots before any great danger from frost arrives.

The order we observe in taking up the roots is this: We break off the stalks—they should not be cut off, it causes much exudation, and rot is more endangered. A plough, without the mould-turner, is passed under the rows to cut off the tap-roots, and ease them for drawing. The hands take about seven ridges at a time, and throw them into the cart. They are carted to the graves, and thatched down with straw. The graves being about seven feet at bottom are gradually slanted up to about five feet in height, leaving a narrow top. The graves are left in this state for a short time, then earthed up, thickly enough to prevent injury by frost, to within a foot of the ridge. This is left open, as long as good judgment dictates, to permit the escape of any fermentation, when they are safely covered up for the winter. If we require them for consumption on the land where grown, we dispense with the carts and throw them into convenient heaps, and cover them over as safely as we can with earth. Being in small

heaps no great danger arises from fermentation, but it is desirable to leave even the tops of these small heaps open for a time, and then make them secure. Some of the long varieties on mild soils will draw up readily without the aid of the plough; but, even in such case, the plough is economical as moving all the roots, and thus facilitates the drawing. The globes must all be raised. Many growers use the spade in taking up mangolds. It is both expensive and tedious, nor does it move the soil like the plough, a kind of culture in itself desirable. Should frost intervene, and any unprotected roots be partially frozen, they must be left standing till some symptoms of returning vitality shows itself; they may then be taken up for more immediate consumption. If they should really *grow again*, they may be graved down with tolerable safety when taken up. Many growers take up large breadths, throw them into small heaps, and cover them down with their own leaves. This is a very hazardous proceeding, and of no especial benefit except a slight protection, and to save a little time of the teams. It is very advantageous to get this work done in a fine season. The clean dry roots going into grave is a guarantee against fermentation, and the pleasant time for the cartage and the hands in working the roots is very gratifying.

THE HEREFORDSHIRE AGRICULTURAL SOCIETY.

Beyond the annual gathering of the Clans, at the call of the Royal Agricultural Society, each one of our three great breeds of cattle has, or should have, an especial place and prominence on their own ground. Thus, we find the Shorthorn to be the centre-piece of the Yorkshire shows, while the Devon should take as high rank at the West of England meetings, and the Hereford play Hamlet in the capital of his county. With, at any rate, two of these varieties, the possession of certain territorial rights and privileges is never disputed, and a rich roan would look no more out of character at the October fair than a white-face in a line of Booth and Bates blood. It becomes, then, very evident that such occasions can scarcely be made too much of by the supporters of these several sorts, as there is no other equal opportunity for creating an impression and extending an influence in favour of the hereditary champions of their kind. Unfortunately, the Hereford breeders would appear to be coming indifferent to the advantages of such an argument, as the displays in their own district have of late by no means carried out the promise made on behalf of their stock at the national exhibitions, as held earlier in the year. It is long since, in fact, that the Herefordshire Society has mustered a shorter entry, or one of less imposing appearance, than that brought together under its auspices during the past week. We refer, of course, solely to the cattle, as neither sheep, pigs, nor horses have ever made much head-way since the regeneration of these meetings. Not, however, that the famous Hereford beast is the less appreciated, as on both Tuesday and Wednesday the streets were cleared early at good prices; but, then, the fair, again, was more or less an echo of the show, with a short supply and a moderate quality. Still, conspicuous amongst the exceptions were a dozen or so really splendid animals, sent in by Mr. Monkhouse, and another capital lot from the Grove pastures of Mr. Benjamin Rogers. It is rather to be regretted that one or two of these were not put into the catalogue, where the steers were pretty generally inferior, and the fat animals anything but up to the gold-medal mark. Rumour, however, went to declare that Mr. Pitt had a wonderfully good steer in readiness for

Bingley Hall, on which arises the inevitable question as to his not being one of the ornaments of his own market-place? It is this system of holding back that must beat the Herefordshire Society; while it is only right to state further that any apparent weakness may in some measure be attributable to the enforcement of a very wholesome regulation, whereby animals bred by persons convicted of mal-practices are rigorously excluded from exhibition. But even beyond this or that, it strikes us that the Society suffers from a deal of collateral spathy. Take, for instance, the railways, which, as far as our own experience goes, do little or nothing in the way of increased accommodation or facilities. On the Gloucester, Ross, and Hereford branch there is no special for the fair week, although in the regular course there is nothing out of Gloucester from between soon after six in the morning to close upon mid-day. There are other causes, too, that the country-gentlemen, who seem so sore and go so short now that their platitudes have been cut down, might look into with advantage; and we only hope they heard what was said by one of the committee in response to that toast at the dinner on Tuesday. Mr. Jancey, who replied, "assured the meeting that it had been the most anxious desire of the Committee of Management to do everything they could to further the interests of the Society, and if they were only better supported, he had no doubt they should even be able to place the Society in such a position that it should be second to none in England. But he was sorry to say that they were not supported in the manner they might be in this agricultural county. When he looked at the societies in neighbouring counties, and saw the very different way in which subscriptions came in—when he looked at the county of Monmouth and at the Newport show over which Lord Tredegar presided, he saw that subscriptions did not come in there so sparingly as in Hereford, for instead of having some half-dozen cups of £5 each, they there saw gentlemen coming forward from all parts of the county, and giving cups—in fact each vying with each other to see who could support the society most. He hoped, however, the day was not far

distant when the committee of that Society would be sufficiently supported to enable them to place the Society in a position second to none in the kingdom." It is, indeed, stated that, estimated by its numerical strength, there will be a better show at Ross in the course of this week than there was at Hereford. There can be no matter of doubt but that the best friends of the Herefordshire agriculturists are those who stir them up from their present indifference to any exposition which their own county is able to offer, and it is with this object that we have spoken to the actual character of the proceedings.

A very commendable feature in the prize sheet is the bull, cow, and offspring class, although the offer of three premiums only produced four entries; so that, according to the conditions, the third offer would be withheld. Three of the bulls, however, were all first-prize winners at Worcester, with the then first happy family, the best again here. Sir Thomas, in fact, with the three essentials of length, depth, and thickness, is now one of the best Hereford bulls out, while he had a more worthy partner than either of the others, where the cows showed in no comparison to their lords and masters. Still, Tambarine's offspring spoke well for a bull whose shape and make say so much for the animal himself; but Sir Oliver, a bull we never quite fancied, even at the head of his class at Worcester, was here wretchedly supported, so that his own position cannot fairly be estimated by the award. Mr. Wigmore's bull, on the contrary, was not equal to his cow, one of the famous heifers we spoke so highly of last year. There should be no finer test of the progress of the Herefords than the entry of yearling bulls, but this has of late been gradually going back, from all we remember it a few seasons since. The show on this occasion was by no means imposing, and the judges only added one commendation to the premiums at their disposal. Still Mr. Capper's first—a close second at Worcester—is a very clever animal, with a deal of style about him, while he has evidently been doing well of late. Mr. Rogers' second is commendable for a good coat and a deal of true character; and Mr. Duckham's two, both by Castor, much of a muchness; but with the preferred of the pair disfigured by a bad horn, and an altogether unprepossessing expression. Noticeably enough, the best bull-calf at the Royal show was passed over here, and there were one or two other winners now without places; though, nevertheless, we must repeat that the lot were not remarkable for their excellence. The renowned Battersea had in reality but little opposition among the two-year-olds, where his touch and symmetry brought him an easy victory. He has manifestly improved since Worcester, though still not in all the *flash* of show condition, the more to his worth and credit as a bull for actual use. Mr. Gibbons' next best was by months the youngest bull in the class, and hence not placed in fair comparison with some of the others, until you went fairly into the relative question. Of a rich claret colour, he has many good points; whereas the highly-commended, another dark-coated animal, had little beyond mere size in his favour. None of the old bulls, but four in all, showed in much form; as Rodney, an otherwise clever one, has clearly gone back; whereas Moderator, terribly over-done, is growing more and more into a lumpy vulgar beast, and very bad to look over from behind. Chieftain was also quite fat enough, but still there was something more like the happy medium here, and hence his pride of place—at Worcester, Moderator and Rodney were both before him. It was a very near thing between the two lots of beasts, and, with due submission to the authorities, Mr. Evans' pretty heifers were quite equal to the Stretford steers, at best but a middling sample; while with the heifer pairs we come to one of the strong points of the show. Both the classes were

well represented by the winners, Mr. Roberts showing a capital couple of yearlings, one of which, Miss Hastings 2nd, was already distinguished as the Royal prize heifer, and now considered to be the best animal in the yard. Not that but Mr. Roberts had another good one in the next division, known as Duchess of Bedford 2nd, also a winner at Worcester, and pronounced now by a second set of judges, who were called in, to be better than either of Mr. Arkwright's two. But the latter were a nicer match, and both very good, of a beautiful quality, fine symmetry, and especially light in the bone. The plums of all these pairs, Duchess of Bedford 2nd and Miss Hastings 2nd, were both purchased on the opening day by Mr. Baldwin, the owner of Battersea. Mr. Perry's two, Lady Battersea and Lady Duppa, have done better single-handed, and here commanded no notice whatever. Of the different pairs of steers, reaching to seven entries for six prizes, Mr. Hill's good level two-year-olds alone possessed any remarkable merit, Mr. Evans not having done justice to his pair; and half-starved steers at such an age have no business on the showground. Of the three fat animals competing for four premiums, Mr. Draper sent a sweet old cow that has worn well, and a thick compact steer, a big little one, in a word, that may be "likely to win a prize at Smithfield," although certainly not a first prize. But it was not until one came to the lots of breeding cows or heifers that we fairly woke up to what a Hereford Show should be, as we halt alongside Mr. Thomas Rea's really splendid collection of seven, many of them famous in their time, and full of style and quality, though still in the condition of breeding cows and nothing more. Then Mr. Wigmore's eight, again, are almost as handsome, perhaps with a little more beef and a little less blood in their appearance, but all strong in the essential points of useful Hereford character. Mr. Taylor, it must be borne in mind, must have been highly tried to pick out another lot from his herd, as the winners of last year were debarred from competing again; but the new batch honestly deserve their commendation. Mr. Gibbons' half-dozen would be strong enough to win at many meetings; and Mr. Evans, who has strength of mind enough not to force his breeding stock, should get his well-bred cows a little more "sarty," and he, too, will have honourable mention. We do not believe that any tenant farmer who goes for Shorthorns or Devons could exhibit better, if as good breeding lots of animals, as were sent to Hereford last week; and with such a foundation it is almost inexplicable that the general character of the show was not as superior. Prize bulls and young animals are of comparatively easy attainment, but there are not many farmers of three or four hundred acres that could venture to drive in their six or eight prize "breeding cows or heifers."

Amongst the sheep, Mr. Downing's Ryelands, the Cheviots of the South, were conspicuous for their excellence, and we never remember to have seen them hitherto so strong in the great essentials of wool and constitution. The Cotswolds of Messrs. Wigmore, Kearsley, and Davis were also very creditable; and Mr. Armitage, according to his own account, "has the great satisfaction of having at length, after many years of unsuccessful competition, obtained the sheep best adapted to the county, and found out the secret for gaining a prize with the Shropshires." The chief failing, in fact, with the sheep was a lack of competition, which was still more observable amongst the pigs, where Sir Velters Cornwall's good whites had nobody to beat but Mr. Reese, of Ross, and a reverend gentleman from Foxley. With the horses it was much the same. Although old Hereford was said to be in the city, he could not overlook the indignity of last year, and Ancient Briton, now the prize thorough-bred one of these parts, had consequently a walk over; while the one cart stallion had to stand out the public gaze with "no merit"

as the estimate over his qualifications. Mr. Embry's bay brood mare had some worth, as had the prize three-year-old hunting gelding; Mr. Price's Young Hereford being also deserving of a commendation, which he did not receive. The rest of the riding horses were but a sorry lot, and quite beneath notice, saving in the extra stock, where one or two of the veriest rips ever bred were placed for the public edification. The cattle in this off section were of a far different description, and it will be seen that several famous animals, ineligible for more direct competition, were deservedly distinguished by certain supplementary premiums. Mr. Felix Smith again took the first prize for the best collection of implements, and Mr. Kell, of Ross, once more the second; the entries here also, as it struck us, not being so numerous as heretofore; though these stands have never held a very important place in the programme. And, then, unkindest cut of all, the prize for cider, was withheld, for there was not a jar of it of anything like what the real Herefordshire should be. Sir Velters and the other judges would not have it, and Mr. Clive being called in, as the donor of the premium, was fain to admit that his offer had produced no proper response; and so the return was recorded, as with "Speed the Plough" and the swing gate—*no merit*.

We got badly off at the dinner, although the room was by no means crowded with company, and fairly forsook our post before they got into the action. The M.P.'s, however, evidently shook their heads over the double thonging they got last year, though it has already done some good, and Mr. King King was very anxious to give something in return. He said: "Although they regretted the absence of his hon. colleagues, it was not impossible that some of them might congratulate themselves upon having to listen to only one speech instead of three. He could assure them, however, that his speech would not be a very long one, because, in the absence of his colleagues, he did not feel in spirits to make a very long speech, and besides that, he had already had the opportunity of addressing his constituents upon two occasions, and should, if it pleased God, have two more opportunities of doing the same thing in the course of the next week. Moreover, one was reminded from time to time, in a not very flattering way, that one's speeches were very dull and very insipid, that they were mere platitudes, and that they led to no practical result; and altogether it was not a very encouraging thing to rise over and over and over again to make after-dinner speeches at agricultural meetings. But he could assure them that he was not at all dismayed, nor at all put out, by remarks of that kind. People who had to fill up 48 columns of a newspaper within a given time must of course write something, and therefore whatever one said, or whatever one did not say, afforded food for their pen and substance for their remarks. He was not at all intending and should not presume to reflect upon the line which gentlemen took in that respect: they had nothing left for it; they had to write and he had to speak, and as he must say something so they must write something. He was quite satisfied for those gentlemen to express their opinion upon his remarks. Whether they considered them practical, or empty platitudes, it was perfectly indifferent to him, so long as he had the good fortune to receive the approbation of his constituents"—and so forth. Our complaint against such orators as Mr. King King is unfortunately the very reverse of that he states. We dare not fill in one of our eight-and-forty columns with his "dull and insipid platitudes," but are simply compelled to say in so many words that they are not worth reproducing. And however much put to it we may be, we fear we shall never again have to give half as much room to Mr. King King and his speeches as we have allowed him here. If, as it seems pretty evident, he had nothing to say, why was he not discreet

enough to stay away, like his honourable colleagues? But only picture the lot of his constituents, who have to sit out this sort of thing *five* times in a fortnight!

PRIZE LIST.

HEREFORD CATTLE.

JUDGES.—W. Taylor, Thingehill Court, Hereford.
S. W. Urwick, Leintihall, Ludlow.

Ball, cow, and their offspring, the offspring to be bred by the exhibitor, and to be calved on or after 1st July, 1862.—First prize of £20, T. Roberts, Irvington Bury, Leominster (Sir Thomas, Prize Flower, and calf); second, £10, William Taylor, Showle Court, Ledbury (Tamarine, Dewall, and calf); third, £5, J. H. Arkwright, Hampton Court, Leominster (Sir Oliver the Second, cow, and calf).

Bulls calved on or after the 1st July, 1862.—First prize of £15, R. H. Capper, The Northgate, St. Weonards, Bam (Worcester); second, £7 10s, B. Rogers, The Grove, Stanton-on-Arrow (Sir George); third, £3 10s, T. Duckham, Bysham Court, Ross (Commodore). Highly commended: W. Perry, St. Oswald, Cholstrey, Leominster (Hereford).

Bulls calved on or after the 1st July, 1861.—First prize of 5 gu., J. Baldwin, Luddington, Stratford-on-Avon (Battersea); second, £3, H. Gibbons, Hampton Bishop, Hereford (Sir Harry). Highly commended: W. Greenhouse, The Harbour, Kingsland.

Bulls calved previous to the 1st of July, 1861.—First prize of 5 gu., J. A. Hollings, Garraway, How Capel, Ross (Chertain the Second); second, £3, W. C. Morris, Whitwick, Ledbury (Moderator). Commended: H. R. Evans, jun., Swanstone Court, Leominster (Rodney).

To the tenant farmer, being a subscriber, who shall exhibit the best lot of beasts, irrespective of sex, bred by himself, and fed without corn or cake, under two years and six months old, in proportion to the quantity of land that he occupies, as follows:

—The tenant-occupier of not exceeding 100 acres, to show two beasts; ditto 150 acres, to show three beasts; ditto 200 acres, to show four beasts; and in the same proportion for every additional 50 acres, up to 300 acres.—The prize of 5 gu., James Taylor, Stratford Court, Leominster, four steers; two heifers (Cowslip the Second and Dainty the Sixth).

Commended: H. R. Evans, jun., Swanstone, five heifers (Rose, Nora the Second, Cherry, Ada, and Blossom).

Pairs of heifers, calved on or after 1st July, 1862.—First prize of 5 gu., T. Roberts, Irvington (Miss Hastings the Second and Perfection); second, £3, Rev. Archer Clive, Whitfield, Hereford (Promiss and Luna). Commended: Rev. Archer Clive (Janet and Myrtle).

Pairs of heifers, calved on or after 1st July, 1861.—First prize of 5 gu., J. H. Arkwright, Hampton Court, Leominster (Gay and Violet); second of £3, T. Roberts, Irvington (Duchess of Bedford the 2nd and Miss Hastings).

Pairs of steers, calved on or after 1st of July, 1862.—First prize of 5 gu., J. Nott, The Grange, Glasbury.

Pairs of steers, calved on or after 1st of July, 1861.—First prize of 5 gu., R. Hill, Orleton Court, Ludlow; second of £3, H. R. Evans, jun., Swanstone.

Pairs of steers, calved on or after 1st of July, 1860.—First prize of 5 gu., P. Turner, The Leen, Pembridge; second of £3, J. Nott, The Grange, Glasbury.

Lots of breeding cows or heifers, not under three years old, that have had a calf within six months, or shall be in calf at the time of showing. The occupier of not exceeding 100 acres, to show two beasts; ditto 150 acres, to show three beasts; ditto 200 acres, to show four beasts; and in the same proportion for every additional 50 acres, up to 500 acres.—First prize of £10, T. Rea, Westonbury, Pembridge (seven cows—Bella, Kate the Second, Issabel the Second, Cherry the Second, Beautiful, Minnie, and Gaiety the Second); second of £5, J. Wigmore, Weston-under-Penard, Ross, eight cows—(Lofty, Broadhorn the First, Curly, Stately the Second, Gentle the Second, Flirt, Broadhorn the Second, and Delight); commended, J. Taylor, Stratford Court, Leominster (seven cows—Silver the Fifth, Cherry the Fifth, Empress the Fifth, Dainty the Eighth, Countess the Fourth, Lovely the Third, and Cherry the Second), and H. Gibbons, Hampton

Bishop, Hereford (six cows—Lofty, Daisy, Spot, Young Lily, and Prettymaid).

Fat cows or heifers having had a living calf.—First prize of 5s. J. S. Draper, Thingehill, Hereford (Cowlip); 2nd of £3. J. Nott, The Grange, Glasbury (Hebe).

Oxen or steer most likely to win a prize at Smithfield or any other cattle show.—Prize of 5 gs., J. S. Draper, Thingehill, Hereford.

EXTRA STOCK.

H. Gibbons, Hampton; four steers, 15s.

The Rev. Archer Clive, Whitfield; bull, 10s.

P. Turner, The Leen, Pembrice; bull (Demetrius) 10s.

W. Perry, Cholestrey, Leominster; heifer in milk with calf, 10s.

J. Wigmore, Weston-under-Penyard; heifer, 10s.

J. Williams, St. Mary's, Kingsland; heifer and calf (Countess) 10s.

T. Duckham, Bayaham; cow (Daylight) 10s.

J. Taylor, Stretford Court; heifer in calf (Countess the Fifth) 5s.; heifer (Strawberry the Sixth) 5s.; cow in calf (Melody) 5s.; and cow in calf (Fancy Leominster) 5s.

SHEEP.

JUDGES.—J. Theyer, Watford Court.

W. Yeomans, Stretton Sugwas.

Pens of twenty Shropshire Down, or short-woolled breeding ewes, under three years and eight months, and not having more than six teeth fully grown, that have suckled lambs to 1st July, 1863.—Prize of 5 gs., A. Armitage, Dadnor, Ross. Commended: J. B. Downing, Holmes Lacy, Hereford.

Pens of twenty long-woolled breeding ewes, under three years and eight months, and not having more than six teeth fully grown, that have suckled lambs to 1st July, 1863.—Prize of 5 gs., J. Wigmore, Weston under-Penyard, Ross. Commended: J. Davies, Webton Court, Madley.

Pens of five yearling wethers, long-wool.—Prize of £5, C. Kearsey, Glaston, Ross. Commended: J. Davies, Webton.

Pens of five yearling ewes, longwools.—Prize of £5, J. Davies, Webton. Highly commended: C. Kearsey.

Pens of five yearling wethers, short-wool (cross-breeds not excluded).—Prize of £5, J. B. Downing, Holmes Lacy.

Pens of five yearling ewes, short-wool (cross-breeds not excluded).—Prize of £5, J. B. Downing, Holmes Lacy. Commended: A. Armitage.

PIGS.

JUDGES.—J. Theyer.

W. Yeomans.

Boars under two years of age.—Prize of £3, Sir Valters Cornwell, Bart., Moccas Court, Hereford.

Breeding sows that have brought litters of pigs within three months of the date of showing, or, being in pig, shall produce litters on or before the 19th January, 1864.—Prize of £2, Sir Valters Cornwell, Bart.

HORSES.

JUDGES.—J. Bosley, Hereford.

Sir Valters Cornwell, Bart., Moccas Court.

Stallions best calculated to produce good hunters.—Prize of 5 gs., George Devereux, Bay Horse Inn, Bromyard (Ancient Briton, by Cothertstone).

Four-year-old fillies, suited for either hacks or hunters.—Prize of 5 gs., F. R. Kempton, Hereford.

Cart mares and foals at foot.—Prize of 5 gs., E. H. Davies, Hampton Bishop, Hereford.

Three-year-old colts, geldings, or fillies, suited for hunting purposes.—Prize of £5, Rev. W. G. Lyall, Castle Froome Rectory, Bromyard.

Nag mares with foals at foot.—Prize of 5 gs., J. Embry, Much Birch, Ross.

Cart stallions.—Prize of £5.—*Withheld.*

WHEAT.

Samples of white seed wheat, grown by a tenant farmer in the county of Hereford, farming not less than fifty acres; the samples not to be less than a sack of five imperial bushels.—Prize of 2½ gs., John Albert Hollings, Garraway, How Caple, Ross (Australian White).

Samples of red seed wheat, grown by a tenant farmer in the county of Hereford, farming not less than fifty acres.—Prize of 2½ gs., G. R. Terry Pennoxton, Ross (Red Nursery).

CIDER.

Herefordshire cider made from apples of the year 1862.—The prize of 5 gs.—*Withheld.*

IMPLEMENTS.

Judges.—J. Theyer and W. Yeomans.

Collection of improved agricultural machinery and implements.—First prize of 5 gs., Felix Smith, Upton Bishop, Ross. Second of £2, A. and H. Keil.

Farm-gate.—Prize of 3 gs.—*Withheld.*

THINGS THAT LANDLORDS SHOULD KNOW.

SIR,—Everything that tends to increase the profit of farming must directly or indirectly benefit the landlord; either by increasing his rental or raising the value of his land, probably both. Every effect has its cause, and there are unfortunately so many preventable losses in agriculture, that I propose one by one to enumerate some of them.

Shelter.—Animals differ in no degree from ourselves in the appreciation of a dry bed and a dry skin, a warm corner in winter, and a cool one in summer. How imploringly will cattle and sheep stand at the field gate in bad weather, when they know there is shelter for them elsewhere! How quickly sheep will avail themselves of a wooden hurdle, a hard road, or even a wheelbarrow or piece of board to lay upon, so as to avoid contact with the wet ground (damp sheets)! It is a well known and admitted fact that a saving of one-third in food results from providing shelter when required. Add this gain, or deduct the 33 per cent. of loss over our 56 millions of acres, with their tens of millions of animals, and you are astounded at the enormous sum total.

Exposure, even in dry weather, to a sharp wind, abstracts an immense amount of caloric from the body, which must be made good by the fuel or fat of the food. Even with well-woolled sheep this takes place in degree,

and it must interfere with their repose, for we cannot rest well when cold.

It is surprising how easy one may extemporise effective shelter. I find it undesirable to house animals at night, and turn them out in the day: the extreme variation gives them cold. I therefore, after thrashing my first wheat, stack the straw, thatch it ready for next harvest, place it on a pasture, surround it at some distance with hurdles, throw down a little straw close to the stack, and make this the night foldyard for my cattle. Here they get their cake, bran, or dry food. Bullocks soon establish, by rubbing and grooming themselves, a comfortable arcade of straw on either side, or at each end, according to the wind. Under this they lie comfortably ensconced, free from driving rains or strong cold winds, and in the day time, weather permitting, go to their feeding grounds.

The act of grooming themselves gives cleanliness, and stimulates circulation in the skin, and pays well in the health and condition of the animals. They know, if their owners do not, that wheat straw is a non-conductor of heat or damp, and they choose it for their bed with unerring sagacity.

There is no currycomb or horse brush so effective as good strong reedy wheat straw, free from weeds, especially

if you have trimmed or shaved the stack. Where reaping by hand is still the practice, a good haulm stack answers well. If landlords knew how cheaply a close shed or covered yard could be erected, and how much it influences and preserves the condition and quality of animals and manure, they would erect them, charging their tenants 5 per cent. for the outlay.

I have such a shed, 57 feet long, 35 feet wide, the walls 8 feet high, a single span-and-space slated roof. This will accommodate 30 two-year-old bullocks. This shed is envied by many a farmer of 150 acres, who say, "This is just what I want: I wish my landlord would put me up such a one; I would cheerfully pay him 6 per cent." I have at present in this shed 27 two-year-old shorthorns. They appear closely packed, but have ample ventilation. It may be called the box system on a large scale.

The straw under them is invariably cut up by steam into 2-inch lengths, and readily forms a homogeneous mass. It need not surprise us that strong reedy straw, so out, readily absorbs urine, for in cutting it gets split and broken; thus the spongy inside of the straw at once absorbs, while the glassy exterior of uncut straw will not absorb. The cost of cutting by steam-power is insignificant.

Your dung-heap is thus quickly formed under the animal, free from destructive heating, which would take place with long uncut straw. Many an animal becomes lung-diseased and destroyed by the fermenting masses in open farm-yards, or even in covered yards, when the early spring sun and an increasing temperature cause heating and decomposition in the long-strawed and less-condensed mass, more accessible to aëration than the homogeneous hodge-podge of chopped straw manure. Assuming that the animals are fed, as they ought to be, with cake, roots, meal, bran, malt combs, and chaff, the dung from this shed, taken direct to the land, will give results that will put to shame the ordinary dung-heap, or even guano. It is always ready for use, and spares the cost and waste of a manure heap. After a heavy crop of tares I have now a fine crop of cabbage. As soon as the tares were removed, acre by acre, the shed manure was at once carted on, spread, and ploughed in, and the cabbages planted in June. The trench-ploughing was very deep, by two horses in the top plough, four horses following in the same

track with a second plough—making a thorough rough job of it—in a stiff clay. This is the way to grow abundant food for your animals at small cost.

I annex the utmost cost of such a shed as mine.

CATTLE SHED.

Length from out to out 57ft. 6in. by 35ft. Height of brickwork from floor 8ft.

BRICKLAYER.	£	s.	d.
3 rods of brickwork at £11	33	0	0
Digging foundation, all materials	4	17	0
Slating, 24½ square, at £1 8s.	33	19	0
7,000 bricks for paving floor, at £1 5s.	8	15	0
116 yards paving, at 4d.	1	18	8
8 loads sand, and carting do., at 8s. 6d.	1	8	0
100ft. patent roll ridge, at 9d.	8	15	0
Screws, putting and setting	0	12	10

CARPENTER.

Roof, 24½ square, at £1 8s.	83	19	0
Iron rods, plates, nuts, &c.	5	0	0
Sliding doors, irons, &c., complete	2	10	0
Pair folding doors end of shed	1	10	0
2 doors and frames to side of do.	1	0	0
30ft. plate glass, at 1s.	1	10	0

£133 14 6

In my opinion it is of the first importance to have on every heavy-land farm such sheds, and most particularly the means of cooking and mixing the cut straw, cake, bran, malt combs, &c., a few cast-iron coppers of ample size could be cheaply and advantageously fixed.

I have observed that fattening sheep will do well in my barn in spite of draught or variation of temperature, while under the same circumstances cattle almost certainly get cold and lung disease.

Probably the dry woollen jacket is a better non-conductor than the hairy coat.

Most people know that boarded or thatched hurdles, haulm walls, &c., greatly protect sheep when folded. Animals intended for breeding or turning out get hardier constitutions when not housed too closely.

October 12.

J. J. MECHI.

WEIGHT, OR MEASURE, WITH UNIFORMITY.

TO THE RIGHT HONOURABLE WILLIAM GLADSTONE, ESQ., CHANCELLOR OF THE EXCHEQUER.

SIR,—A deputation has been appointed to wait on you to explain their views relative to the alteration in the law of levying the duty on grain by weight, instead of by measure.

As one of the early promoters of this measure, and being extensively engaged in the import of grain, the general meeting kindly named me as one of the deputation, and it is with regret that I fear my inability to attend to explain my views why I differ with the scheme adopted in the report forwarded to you.

I object to the scheme adopted in the report—first, because 500lbs. as an imperial quarter of wheat is too high a standard, far exceeding the natural weight of an imperial quarter by measure on an average of imports, therefore unequitable to the many interests involved; and secondly, the many difficulties that present themselves in carrying such a scheme through the House of Commons. On both points opposition will be provoked: on the first by the agricultural interest, because the increased standard must raise

the averages, and thus the tithes on the producer; on the second point the shipping interests will oppose as affecting their freights.

Under those difficulties, if no other scheme is ready, I fear the object of introducing *weight* instead of *measure* in the sale of grain may be defeated; to guard against which I submit for your consideration my scheme, which is based on equity, and avoids the objections.

In the first place, I respectfully suggest that you direct the collectors of customs at Liverpool, Glasgow, Cork, and Dublin, to furnish you with a report as to the average weight per bushel and quarter of wheat imported into those extensive ports. That basis established, then the natural contents by *weight* of the present imperial quarter by *measure* will facilitate your decision.

In 1834, a committee of the House of Commons, after a labour of many weeks in hearing evidence from the principals of the grain trade, reported "That it was most desirable to establish the sale of grain by weight, but the

standard of weight must approximate as near as possible to the contents by measure; that the legislative enactments affecting tithes, rents, and duty might remain undisturbed." Subscribing fully to the wisdom of that report, and believing that, if the views therein expressed are adopted, the present memorialists will obtain all that is required, without disturbing either the revenue from duty or other existing interests, I respectfully submit that the scheme I propose is the one easy of adoption and the less likely to meet opposition in the House of Commons when under discussion.

I propose simply that the words affecting the measure of corn in Act Geo. IV., cap. 74, clause 6, be repealed, and that a clause to carry the following words shall be substituted, viz.:

60 lbs. the bushel of wheat, beans, peas, maize, and rye.

50 lbs. the bushel of barley and buckwheat.

40 lbs. the bushel of oats.

Eight of each such bushels of weight to be considered the standard by weight of

THE IMPERIAL QUARTER.

That act must be repealed, or much confusion will be established; because if not repealed there will exist an additional imperial quarter by measure, which some parties might claim as a legal measure, if not absolutely abolished or provided against, and while importers would be paying duty on the imperial quarter by weight, a captain might

claim his freight on measure, in accordance with the above act.

Measure has been proved most inaccurate, and on damaged cargoes of grain most oppressive and unjust, to correct which unanimity of opinion exists that all grain should be sold by *weight as a system*, and it is hoped that uniformity will follow, and thus greatly facilitate the obtaining more valuable agricultural statistics.

In the scheme I propose, the revenue from duty, tithes, and rents will remain undisturbed. In the scheme proposed by the committee these sources of income would be deranged.

500 lbs. as the quarter would reduce the national income as duty, and raise the averages; thus increasing tithes on the producer. The low standard of 800 lbs. for oats would most unjustly and disproportionately raise the duty on the lowest priced grain; and although the scheme proposed by the committee, presenting easily marked figures, looks attractive, yet when examined in detail no doubt can exist that if so high a standard should be adopted, it will act oppressively on some interests involved in the change.

Should my scheme not meet with favour, I join heartily with the advocates of *weight* instead of *measure*, and I hope some act of Parliament will be passed, that the sale of grain may be by *weight* on such a standard that will promote *uniformity*. I have the honour to be sir,

Your obedient servant,

THOS. M. USBORNE.

Cork, 18th July, 1868.

KEEPING CATTLE, HORSES, AND SHEEP TOGETHER.

The economy of keeping horses, cattle, and sheep in a pasture together, or at the same barn, is perhaps not generally considered or understood by many farmers. There are at times some disadvantages in keeping different kinds of stock together, but, so far as the economy of feed is concerned, there is evidently a saving by so doing.

From experiments and investigations made on this subject, it has been ascertained that domestic animals eat and reject plants in the following proportions:—

The cow eats	276 plants,	and rejects	218 plants.
The goat	449	"	126 "
The sheep	387	"	141 "
The horse	262	"	212 "
The hog	72	"	271 "

Every farmer has noticed that many plants that are eaten by one kind of stock are rejected by others; that cattle and sheep are averse to eat the grass that grows in those places where they lie at nights, or in the shade of trees where they get together, in consequence of the unpleasant flavour given to it by their droppings—yet the horse will eat it readily. The horse will eat many coarse grasses and weeds which cattle and sheep will refuse. For this reason will be seen the economy of keeping horses, cattle, and sheep in the same pastures, in suitable numbers and proportions.

I have heard some farmers say that they did not think that it cost anything to keep a horse or colt in a pasture with cattle, as they would get their living on that which the cattle would not eat. For my own part, I do not think the saving is as much in the summer, when they can select their own food, as in the winter, when they get only such as is given them.

It is generally thought that sheep and colts do well when kept together. Colts will eat the coarser portions of fodder which sheep leave, and do well on it. The fact was forcibly brought to my mind while visiting the barns of a noted

sheep-breeder—the spring of 1869. There were about fifty sheep, which were about equally divided and kept in two separate pens. The hay with which they had been fed was a mixture of red clover and timothy, and the sheep were literally up to their knees in the coarser portions of the hay which they had pulled from their racks on to the floor and rejected. This might not be entirely wasted, as it goes into the land with the manure; but if this waste hay had been consumed by colts, it would have been made into good manure, and the gain or growth on the colts saved. It was the opinion of both myself and the gentleman who was with me at the time that a two-year-old colt might have been well kept, in each of the pens, on the hay which the sheep wasted.

During the latter part of last winter, while feeding my coarse hay, the oats which my cattle and sheep left were given to my horse. They were eaten up clean by the horse, who appeared to do as well as when fed on fresh hay, and many days but very little other hay was fed to the horse. A friend of mine who had a horse that was troubled with the heaves, kept it a part of the winter entirely on the hay that his other stock left. The horse did much better during this time than when fed on fresh hay—the cattle picking it over, removed the dust and lighter portions of it, which had the same effect as wetting it before feeding it to the horse. In cold and dry weather in the winter, when my barnyard is covered with snow, I frequently take what is left by the cattle and sheep after feeding in the stables, and scatter it in the yard. The cattle will always clean up that which the sheep have left, and the sheep will eat a part of that left by the cattle, and the colts will pick up what is left by both cattle and sheep, so that between them all but very little fodder of any kind is wasted, but much is saved during the winter, that would be wasted if only cattle or sheep were kept, or kept exclusively by themselves.—
"C. T. Alford," in *Albany Country Gentleman*.

THE BLOFIELD SHOW.

The hundred of Blofield has generally been called the "garden of Norfolk." Not that the superior farming of the district means that the tillage is, in neatness or excellence, equal to garden culture; but it is naturally fertile land, and in days of yore was comparatively well farmed, when some of the Holkham estate grew nothing but rye and rabbits. The Blofield Union comprises that district east of Norwich which lies chiefly between the Yare and the Bure, so that the table-land of the interior is almost all arable; and the outskirts, which border on the two rivers, are chiefly low marshes.

More than a quarter of a century since, an association for rewarding deserving labourers was established; and a show of stock was soon after added. The money matters of both societies were kept distinct from each other. The annual exhibitions of stock had dwindled to almost nothing. But last year a determined effort was made to resuscitate the Society, and the result was a very fair show in '62. But the meeting of Friday, Sept. 23, was in every respect a great improvement on the shows of any former years, notwithstanding the prize-list had been curtailed of many of its second premiums.

Blofield has generally been celebrated for good horse stock; but the prize for cart stallions this year was taken by an outsider, Mr. J. N. Waite, into the Flegg Hundreds. This "Sir Colin" is a dark chesnut horse, and ran second at North Walsham, the other day: he moves well, but is rather high in ribs and muscle. Had not Mr. W. Jary's Clydesdale colt shown a little stiffness in his hind legs when he was trotted out, he would without a doubt have been placed first. There was a goodly array of cart mares, 13 very useful animals being paraded round the judges' ring. The first prize fell to Mr. R. Gillett, for a very useful and well-made bay mare, a good stamp of a Norfolk cart horse; while the second award went to Mr. Waite's "Scot," an equally good specimen of a Suffolk, and this was the mare that ran first at North Walsham. The prize of the day was a handsome silver cup, presented by Mr. W. A. Gilbert, for the best agricultural mare and foal; and the judges, after a long consultation, awarded the cup to Mr. Wm. Jary, for a big and useful mare with a very fair foal; but Mr. R. Gillett's foal was infinitely superior, and therefore won the £2 which was allotted for the cart foals. Mr. Bessey's only entry for a three-year-old filly walked over the course; but the two-year-old and yearling classes were well filled, the honours being again divided among Mr. Jary and his neighbour, Mr. R. Gillett. The latter gentleman also secured the prize for the best hackney colt, but in the aged class of riding horses Mr. H. Gurney's old grey hunter, a well-known horse with the Norfolk foxhounds, was placed first, though hard pressed by Mr. H. P. Green's gallant grey, a powerful well-built one but rather stale on his fore-legs.

So much for the horses, which were not on the whole better than we have seen some years ago. Next on the list comes the cattle. The entries of bulls was short, only four Shorthorns and one home-bred competing. Mr. H. N. Burroughes won the prize with a yearling Shorthorn, bred by Lord Suffield. This is a nice square bull, with capital coat, and good touch, but his nose is a shade too dark; his bone is a little coarse, and his shoulders are heavy and plain. Mr. C. S. Read's "Early Furl," from

Branches Park, was highly commended by the judge. Mr. W. Birkbeck's useful bull, bred by Mr. H. K. Thompson, had to put up with only a third class certificate, though he won the first prize last year. Mr. Birkbeck was more fortunate with his cows, winning both prizes, with two roomy, square, and fleshy Shorthorns, and he also took the first premium in the heifer class. The President, Mr. Cator, came in for a second place with a pretty home-bred heifer; and the peculiar features of this class of Norfolk cattle—polled, of course, all white with the exception of red ears and black noses—attracted much attention. There was a splendid show of fat stock, the whole class being commended by the judges. Mr. Jary, of Burlingham, won the only prize: he showed two good shorthorns, one of excellent quality, but he had not laid on his meat so evenly or so abundantly as his next lucky partner. Mr. S. Goulder's white one was a level and well-grazed beast, and Mr. H. N. Burrough's pair of great shorthorn bullocks were very fat; nor was Mr. C. S. Read's three-year-old roan steer otherwise than exceedingly good Christmas beef. In the cattle for winter grazing there was a sharp competition; shorthorns, Devons, home-breds, and Highland Scots all contending for the prize. Mr. Allard's big old bullocks were first, and Mr. T. W. Gilbert's two-year-old home-bred—a very nobby steer—won the second prize. This class should be divided into two, for it is unfair that the aged oxen of Mr. Allard's should compete with the yearlings and two-year-old steers that were entered. No beast in the class had, according to the conditions, been yard or stall-fed before the 1st of September.

Blofield is a poor sheep district, yet this meeting brought together a most excellent show of sheep. In rams Mr. H. N. Burroughes took the prize with a Cotswold, hired from Mr. Tom Allen, of Mark's-hall. Three pens of 10 ewes were shown, viz., Norfolks, Hampshires, and Southdowns: Mr. C. S. Read's Hampshires were placed first. There was the large entry of 12 pens of fat sheep; and here, again Mr. Read was the winner, his 5 wethers (from his Hampshire ewes, by a ram of Mr. Jonas Webb, and the cup lambs of last year) being unquestionably the best sheep on the ground, if we except one pen of three half-bred wethers shown by that gentleman in extra stock. Six pens of strong excellent lambs were exhibited, and once more the prize fell to Mr. Sewell Clare Read, his 10 half-breds being of noble frame, of great size, and very full of wool.

The pig classes were not so numerously filled, yet some exceedingly useful swine were shown. The contest all lay between the Rev. T. L. Fellowes's whites and Mr. Waite's blacks. A black sow was placed first; but in boars Mr. Waite's over-fed pig was properly disqualified, and so the lot fell on Mr. Fellowes's boar: while in store pigs Mr. Waite's capital pen of 8 blackmoors, just a day or two within the proscribed age of six months, had an easy victory over the only other entry in that class.

Nearly 50 ploughmen contended for the prizes: these, men and boys, with the other deserving labourers, had a good dinner, at the Globe, and there received their prizes; and afterwards followed in due course the dinner of the members of the association, which, lacking the presence of Mr. Howes, the East Norfolk M.P., was an unusually dull and stupid affair.

ON HARVESTING THE POTATO CROP.

BY A PRACTICAL FARMER.

The season is now at hand for taking-up and graving the potato crop, and, as much loss very frequently occurs from haste and mismanagement in the taking-up, a few words upon the subject may not be inappropriate. I have one fact already before me of loss in this season. A small quantity of ash-leaved kidneys were taken up and deposited in heap. In a week or two they were required for market, and, on proceeding to dress them, about a fourth was found to be decaying and unfit for use. Another case of last year I would name: these were Dalmahoy's. The crop was taken up early, and the *wares* sent to market. The seed was reserved for sale and planting: nearly the whole of the seed rotted. The cause of these failures, and hundreds of others that might be cited, was owing to immature harvesting. The crops were not fully ripe—they were still growing, consequently not in a state to be taken out of the ground.

The proper time for harvesting the potato crop may readily be ascertained. In the first place the haulm should all be decayed—the stems or stalks actually dead. The potato or the tubers should be in such state of ripeness and hardihood as to prevent the skin or outer-coat from peeling off when rubbed by the hand. The time for pulling apples is known by their pipe turning brown. The precise time for taking-up potatoes is when the tubers are so advanced as to retain their outer-skin when rather roughly rubbed. This is the great criterion; and no tubers should be disturbed except for immediate use, unless upon examination this proof is ascertained.

I need not to observe that this remark applies to all varieties—the early and the late. It is quite a mistake to take it for granted that when the season arrives all must be ready for taking up: this will depend upon the variety planted. The early varieties would be ready by the middle of August; the latter sorts not earlier than October, as a general rule. All, however, depends upon abiding the test of a rough rubbing and the deadness of the haulm; and great care should be taken to fully ascertain this before commencing "the taking-up." It is very provoking to find that, after all your labour and anxiety to get them into grave, "they will not keep;" and often is this the fact, but which by ordinary care and judgment might be prevented.

The precise or actual time for taking up should be during mild dry weather. The cleaner and drier they can be got into grave the better; a little dry earth going into grave with them is by no means objectionable; it often preserves the graved crop from growing and subsequent rotting. It cannot abide much fermentation, hence the necessity for ripeness and fulness of growth—full maturity. If the crop is required for immediate use, it is not absolutely required to have them so clean and free from dirt; indeed, in some cases, it has been known to preserve both their quality and colour. Here again the farmer's judgment must be his guide; if the condition of the soil and crop is wet and unfavourable, he will, of course, wait awhile for a more suitable season. They must be well got.

The modes of taking up are very various: the more common, and almost for many years the universal way, has been to plough the rows up with the ordinary plough, pick the exposed ones, and fork out the remaining. This is now fast giving way to several new appliances of ma-

chinery and adaptations of the plough. Hanson potato-digger is a very effective machine for casting them abroad out of the rows; it also at the same time does good service to the soil, by throwing abroad the row so effectively that all is spread ready for the harrow, and not a semblance of a potato-row is to be discerned. The chief drawback to its more general use is the heavy draught; it can scarcely be properly worked by a pair-horse team throughout the day; otherwise it is most effective. Howard's new fittings to their moulding-plough is far more simple, and effects the up-rooting of the crop and the partial casting it out on to the surface. Ransomes have a like arrangement added to their Universal plough, which may now truly be said to be fully adapted for every purpose of ridge culture. These kinds of implements have unquestionably and very beneficially superseded the common potato-fork. It is most desirable, if not imperatively necessary to raise the crop without injury to the tubers. This cannot be so well done by fork as by traction implements being made to pass under the roots sufficiently below the tubers, upheaving them, and spreading them on the surface; the saving in expense is also very considerable. A good pair-horse team, with one of these upheaving-ploughs, would, in a good crop, keep thirty to forty pickers in full work. How many forkers would it take to do the like? If carefully ploughed up by an attentive ploughman, scarcely any loss arises from injured tubers, whereas diggers are continually stabbing them with their forks. The mode of throwing them upon the surface by aid of the new plough arrangement, will, I trust, meet with great public favour. In order to throw out all tubers properly, it is necessary to have all the haulm carefully put aside or previously got off, so that no hindrance or obstruction takes place.

The picking and graving will, of course, go on simultaneously. For this purpose a suitable and convenient place should be prepared, and the line of the grave marked out. The carts, as soon as filled by the pickers, should be taken to the grave with all expedition, and there be carefully tipped and emptied, so as not to bruise any in the grave, or destroy the rolling tubers. The grave man should lay them up nicely and evenly. The grave should not exceed six feet in width, with a corresponding height, the slant to be gradual, not steep. If the weather is fine and dry, the grave may remain exposed during the day, but at night it should be covered with a thin layer of straw, drawn out as for thatch, and placed thereon as for a temporary thatching, to be secured by spits of earth to prevent its disturbance by wind, &c.

At the time of taking up, it is customary with many growers to partially dress or clean them before depositing them in the grave. This takes up too much time. It is better to get them up in suitable weather as speedily as possible, and await a favourable time for cleaning. I have seen several machines which have been invented for cleaning and dressing potatoes; I have used a good one many times; but I have never found it, or any other, to dress sufficiently well to please a clever potato salesman or potato merchant. This class of men require every sieve-full to be looked carefully over, and every failing or unsightly tuber to be picked out. Till this fastidiousness is got rid of, I fear the potato machines will not obtain favour. This is to be regretted, as, with trifling exceptions, they clean and

dress remarkably well, and far more quickly than by manual labour. The difficulty in the dressing is to prevent a little one, or, now and then, a coarse or partially diseased one from running down into the general heap; for however careful the attendant pickers are at the machine, and watchful as they drop, many will get missed, and the dealers say they spoil the sample. They are admirably adapted for taking out the dirt; but growers seldom like two operations in dressing, so that the sieve or riddle is not as yet superseded. In the final covering of the grave, attention should be given to have small chimneys along the top, at rather wide intervals; this allows any slight fermentation to escape. Upon the approach of frost, these chimneys must all be closed, and the whole

grave well and safely earthed up. The thickness of earth requisite will, in some measure, depend upon its state at the time. If it is stiff and siddy, it will not settle close enough to prevent the frosty air from penetrating; consequently more is required, and it will be necessary to trample the layers and beat the sides well, to make all close and impervious. If the earth works mildly and free, less is requisite, but it must be made close and compact. My usual way is to begin with a bottom 18 inches thick, and gradually close up to the top at 18 to 14 inches. On the top I lay the haulm or any strawy matter I may have at hand, which is often of great service in a severe winter or a protracted frost.

ANNALS OF STEAM CULTURE.

Having accepted an invitation to visit Mr. Bomford's farm at Pitchill, I drove through Evesham, a pretty town, surrounded with gardens, on the banks of Avon, and found it at the foot of a range of hills to the east of Dumbleton. The name Pitchill seems to have been derived from the fact that Cromwell, during some period of the Worcester contest, pitched his tents there. Between Evesham and Pitchill lies the fine estate, in the parish of Norton, recently purchased by the Duke D'Annale, from Edward Holland, Esq., M. P., with its well-kept fences and pretty cottages. The duke is becoming quite a large landed proprietor in the neighbourhood, having also just bought a large tract of land from the Earl of Harrowby, and is much liked by the tenantry of both the middle and lower orders.

The Pitchill farm lies at the junction of the lias and new red sandstone formations, and is therefore of various character, some of it being easy-working land, and some very stiff. Five horses are used in the neighbourhood to carry a furrow 4 x 9; but four horses will suffice if they are judiciously yoked. When five are used in length, or in line, the power of one may be said to be lost.

The farm now consists of 800 acres, 600 being arable and the remainder in orchard and grass. The arable land may be divided into 400 acres of light land—a gravelly loam—and 200 acres of stiff clay. Mr. Bomford came into possession of this valuable property about 14 years ago. It then lay in four separate farms. The fields were small, and, as usual, cumbered with wide hedge-rows and hedge-row timber; all since cleared away at a very great expense. They now consist of large areas, with straightened boundaries, every way very suitable for steam-culture. The land has been deeply drained, and looks as though, after this preparatory outlay, it would yield even more than the expected return. The four-course rotation of crops is adopted on the lighter soils; the six-course with wheat every other year, on the heavy land. The stubbles looked strong and surprisingly clean, and bore testimony to the efficiency of Howard's cultivator, which had been at work upon them.

Steam-cultivation was here commenced in November 1861. For the first twelve months Howard's tackle was used with very good effect; but Mr. Bomford being impressed with the advantages of using two engines, made an exchange of the roundabout apparatus with Mr. Savory, of Gloucester, for a couple of eight-horse engines and tackle, such as he showed at the Worcester Meeting. With these he worked a Fowler's plough and a Howard's cultivator.

This is undeniably a bold move, but whether it is a wise one time will prove. Two engines with a direct pull is certainly the system for hire, because of the facility with

which the whole can be taken from one field to another. At Worcester, for instance, when timed, Savory's tackle was taken up, moved half-a-mile, and set down to work again, in 25 minutes. All competitors were far behind in this respect; and I think, Savory's was the only set of tackle moved without horses. It is hardly necessary for me to say, after the description given of this apparatus from the Worcester trial grounds, that great cylinders five or six feet long enclose the boilers of the several engines, and each carries 400 yards of rope in a single coil. An automaton hand, guided by a screw, conducts this rope in its departure from, or return to, the cylinder, with the greatest precision. While one engine is letting out its rope, the other is winding it up, of course; and (this may be considered the worst part of the arrangement) while one engine is working, the other is idle, and yet consuming coal, and requiring attendance.

The speed attained is very great. At Worcester it was four or five miles an hour. Mr. Bomford assured me this was the habitual rate. The work that has been done by this combination has been thoroughly satisfactory, I find; and there is, indeed, no reason why it should not be, because where Fowler can work well, Savory can also. It is merely a question between them, to be decided by the comparison of expenses.

This experiment was commenced November 1st, and continued with some interruption till a little time before I made my visit. During this period 440 acres were cultivated and 44 ploughed. The ploughing was done at the rate of nine acres a day, and very deeply, that is to say, fully 11 inches, as I can testify, in the stiff clay. So severe was the work, that the engines were absent when I went to inspect the operations at Pitchill, having gone to be changed for some of higher power.

Mr. Bomford commenced in November, 1862, then, with two eight-horse power engines, &c., which cost altogether, with implement, £800—a sort of "swap" having been made. The daily expenses were as follow:

	£	s.	d.
Two engine-men	...	...	0 5 0
One ploughman	...	...	0 2 6
One man at water-cart and coal-cart	...	...	0 2 0
One horse for ditto	...	...	0 2 6
Two porter-boys	...	...	0 1 6
One ton of coals	...	...	0 15 0
Oil	...	...	0 1 6
			£1 10 0

Here let me observe that one engine-man is added for an anchor-man dispensed with, and the chief additional expense of this, over the apparatus with single locomotive

engine, consists of half a ton of coal and one-half the oil stated, in all about 8s. 8d.

From these figures can be obtained some approximate conclusion. Mr. Bomford allows $7\frac{1}{2}$ per cent. on the capital for depreciation and refunding, $7\frac{1}{2}$ per cent. for wear and tear, and 5 per cent. for interest—in all 20 per cent. This calculated on £800 gives £160; which divided by 120 days is equal to £1 6s. 8d.; to this add the above £1 10s., the daily cost of manual labour, fuel, &c., and we get a total of £2 16s. 8d. as the daily expense of the double-engine set of tackle. Supposing eight acres to be a fair average, we arrive at the cost of ploughing an acre, namely 7s. 6d.; so that although two engines appear to be a heavy encumbrance on a farm, the result, so far as this calculation goes, proves rather that there is a saving effected by their use.

"And what," said I to Mr. Bomford, in reference to a field ripped up about a month ago, "would this work have cost, done with horses?" The reply was simple enough: "It would have cost nothing; for I could not have broken it up at all. The ground was too hard; and it must have remained as it was, so far as horses were concerned." None of the ploughing on this clay can be done under 15s. and 20s. an acre.

There are two 10-horse power engines daily expected to carry on the autumnal work. The cost of the set will then be as follows:

	£	s.	d.
Two 10-horse engines	1,000	0	0
800 yards of rope	50	0	0
Powell's plough and cultivator combined	100	0	0
Howard's cultivator	20	0	0
Water-cart and porters	30	0	0
	£1,200	0	0

To balance the increased outlay there will, of course, be increased power to work. In using two engines, however, some device should be hit upon by which the engines should assist each other, and thus do away with the idle engine, and allow of engines of lighter weight being used. Thus two 6-horse engines pulling together would equal one of 12-horse power, and be far more easy of management. This mechanical problem is, I think, in a fair way of being solved. Mr. Bomford speaks with great confidence as to the increase in the grain and root crops in consequence of the use of steam; and probably, when he has had a little more experience, he will be able to give some interesting facts, to show that wheat can be profitably grown at 5s. per bushel.

The farm is much improved since steam was called in to do battle with the clays. The sunny southern slopes are planted out generally as plum and apple and pear orchards. Worcestershire is a cider and perry county, and the markets around afford a good opportunity for the disposal of the plum crop.

On my return from the meeting of the Agricultural Society at Derby, I stopped at Loughborough for the purpose of witnessing what was being done in the way of steam cultivation by Lord Archibald St. Maur, who had purchased a set of steam tackle from the Messrs. Howard at the commencement of the present year. The morning was bright; and the ride to Walton, the residence of Mr. Mountstephen, his lordship's farm bailiff, was pleasant. Having hired a trap of a game-dealer near the station, a gamey fellow, with two peacock's feathers stuck in his hatband, took the reins; and we flew over the country as though we were coursing a hare, he amusing me by the way with various tales of poachers, of whom he seemed to know more than he would, I dare say, desire to confess.

It will be remembered that the new red sandstone extends over the West of Leicestershire; and had I any doubt as to the geological formation over which I was riding, the cuttings which had been made to reduce the

gradients of the road displayed the variegated marls of this series, known as *Keuper*, in a very unmistakable manner. It is what would be called in the Northern States of America a fine "rolling country," and is well known to the members of the Melton Hunt. These red and yellow marls, although pretty to look at, whether lying in naked fallow or covered with rich pasture and beautiful elm, ash, and oak timber, afford stiffish ploughing; for I nowhere saw fewer horses than three, linked to draw but a shallow furrow, and sometimes I discovered four. The fields for the most part are small, with a good deal of hedgerow timber.

Arrived at the little village of Walton, lying on a hill-side, I found the steam cultivator had done working there, and had gone to a farm two miles distant, Burton by name, near the residence of his lordship. Following up the scent, we went down into the village just named, and then ascended by the road to an open plateau, where the engine was steaming away in a field which, together with the whole of the district, had not many years been reclaimed from the Burton Foss, a considerable reach of which is retained by the roadside, for the cows of the villagers.

The apparatus was stationed on a bean stubble where the waggons were at work, carrying off its few last loads of beans; but the cultivator was skimming a clover lea on the other side of it, and doing good work. There was no master there to see that everything was right for the visitor, and I therefore caught the men unawares, and was glad to find all going on well. The tackle since it came has been nearly constantly at work; there have been but few stoppages, the evidence of wear are very slight, and the rope has never given way in the fair direct work of cultivation. One day it sundered at the windlass by becoming entangled; and one day, the cultivator coming in contact with a stone, it snapped. Saving these two mishaps there have been none, and the rope looks not more than one-third worn. The engineer told me that the men employed were all common farm labourers who had been otherwise engaged upon the land before the tackle came. He said the five men had 2s. a day and five quarts of beer between them and the three boys. The rope was nicely carried everywhere, and, by means of the new porters in the line of the implement's passage, the boys then were easily able to keep it off the ground. The men on headlands use three anchors each; two coupled together, one behind the other to sustain the pull, and the other, an idle one, to move forward to the next station. I observed that no holes were dug for the anchors, and that they drew into the ground when the strain was upon them. "They did sometimes give way," I was told, "but very rarely."

Being requested to walk over an adjoining field which had just been broken up after beans seven inches deep, I did so with pleasure. It presented all the appearance of having been twice ploughed and once scarified, whereas the fifteen acres therein contained had only been once moved in one and a-half days. A large set of harrows was standing on the piece which had been half broken down by them. These took a breadth, I think, of seven feet, and by steam were supposed to go over the fifteen acres twice in one day, the teeth penetrating to about half the depth of the tines which had preceded them. I do not refer to the Norwegian harrow, which is also sent out by the Messrs. Howard, but the ordinary three four-beam drag harrows sent out by them to be worked by horses, set in a frame, made to work backwards and forwards, and steered in the same way as the cultivator. I was assured that six horses would not have broken up the same piece to a greater depth than four inches at the rate of three acres a day at the outside; so that if anybody is inclined for a little bit of calculation, here are some of the necessary items for it, at all events.

Not being successful in my search for the bailiff, I left my card at his house, and he has obligingly sent me the following particulars:

The land in Lord St. Maur's occupation is about 850 acres. Of this quantity 550 acres are arable, and 300 grass. The whole of the arable land is heavy, the substratum being clay, and four horses are generally used in ploughing a furrow 4 by 9 inches. A great deal has been done to prepare the farm by steam. Several fences have been removed, and a considerable amount of timber. The average size of the fields is now about 16 acres. The land has been drained from 3 to 4 feet deep, and since cultivated by steam, "*it dries in half the time of similar land, also drained, done with horses.*"

The apparatus was supplied in the last week in February of the present year. It then consisted of a 10-horse power engine, £395; one three-furrow plough, £50; one cultivator, with windlass, 1,600 yards of 1½-inch steel-wire-rope, rope-porters, snatch-blocks, anchors, &c., £230; duplicate parts and fittings, &c., £53; the set of harrows, £20.—Total, £648.

Beyond the cost of some two or three rope-porters accidentally broken, the repairs are *nil*.

The work done is as under: Up to the 24th June last, 263 acres of the heavy soil had been ploughed and cultivated, and then the tackle was placed under cover till about a month ago, when it was again put to work, and has since broken up, crossed, and harrowed 50 acres, and broken up and harrowed 40 acres of stubbles.

"From the experience we have had," writes Mr. Mountstephen: "I consider we can break-up our strong land 9 inches deep, at a cost of 4s. per acre, doing upon an average 6 acres per day, including removals, &c. I shall not pretend to estimate the wear and tear, but I am quite satisfied that it will not be greater, if so costly,

as it has been with horses. As an instance of the cost of the latter, I sold three horses by public auction for £23, which originally cost £122, and a number of horse implements at less than half their cost.

"I have reduced the horses on the farm from 31 to 13, although 70 acres of additional land have been taken in hand; this was in a wretched state, and would have required 4 more horses, so that I consider I am doing with half the horse-power, besides being much more forward with my work than I ever was before. The horses I now have are more cheaply kept, and have done for harvest, for I have stacked more corn in the field instead of drawing it all to the stackyard."

This additional land taken into cultivation would have necessitated the purchase of 6 more horses, instead of which it will be observed the writer has parted with 6.

I requested to know whether it was thought that steam cultivation had made any difference in the texture of the soil or its produce? The reply is as follows: "The land is worked with about half the power now where it was steam-cultivated in the spring. No increase is to be observed in the crops, the summer having been rather dry; harvest is much earlier, owing to our having been enabled to sow earlier in the spring.

"No difficulty whatever," has been experienced in finding men to work the tackle. "I consider our trial of steam cultivation a great success," writes Mr. Mountstephen, "and it is admitted to be so by most of the people who have seen it, and by those who were most prejudiced, especially the old farm labourers, who were certain it would never answer. I am convinced, when our land is once in condition, the cultivator will do all the work, and enable us to dispense with ploughing altogether."

F. R. S.

THE BEDFORDSHIRE AGRICULTURAL SOCIETY.

MEETING AT BEDFORD.

That a society formed for the promotion of any good cause meets for the celebration of its sixty-third anniversary is a fact which tells well for strength of the cause, and the determination of those who espouse it. That such a society, having for its object the promotion of agricultural progress, should have stood so long, while it is matter for congratulation, is matter for surprise also, because most of the societies which started contemporaneously with it are now amongst the things that were. Their failure is due to many causes, one of which has been that want of pliancy to adapt them to the great changes which will occur in the notions and practice of a country during even half this period. Those entrusted with the rule have rested upon the honour, without seeking to merit it; they have, perhaps, lacked generosity and wisdom in their opposition to the infusion of new blood. In many cases these societies have rested nearly entirely for support upon the landed proprietors of the district, a circumstance fatal to their long life and healthy action. And I observe that the Bedfordshire Society is at present in no little danger in this respect, for the landlords contribute to its funds beyond that proportion which should be expected of them. An equilibrium should be established at once; the subscribers might easily in such a county be increased from 150 (!) to 500, and the almost invariable half-guinea which follows each name should be doubled at least. This done the exhibitors of stock need no longer complain of the scantiness of the prize list. On Friday, Oct. 2,

the Society met at Bedford to dispense about £200 in prizes designed to encourage skilled labour and the breeding of superior stock! It is a fact well deserving of notice, that nearly half this sum is set apart for the first-mentioned of these two concomitants of agricultural progress; and it is to this circumstance, perhaps, that the age of the association is due, for the great strength of agriculture must lie in the encouragement given to skilled, honest, thrifty labour. A few remarks on this branch of the subject will not be out of place.

Besides the rewards offered to those labourers who have brought up large families without parish relief, special notice is taken of length of servitude. There are here instances of men who have been with their masters half a century. There were forty-three candidates for the four prizes offered, the highest of which was given for fifty-three years of service, and the lowest for fifty. It is not to be supposed that the master is insensible to the worth of his servant, and that the Society steps in to do for him what he lacks the good feeling to do for himself. Multitudes of privileges and little acts of kindness are accorded him all the year round; and when the infirmities of age steal upon him, he is not turned adrift in favour of a younger man, but retained upon the staff, with duties suited to limbs grown feeble in the service of the master. This is, I think, invariably the result where so continuous a union has subsisted. There are sympathies of unusual strength called into play

between the master and the servitor, who have grown old together. There is a class for men under 35 years of age. The society recognises also the faithful service of female domestics. Awards given to shepherds for rearing a certain proportion of lambs from flocks of given dimensions, are of great advantage, and should figure upon the prize schedule of every such society. Cause and effect follow each other in such quick succession that the appeal to the shepherd's superior qualities of vigilance and tact are at once responded to. So many lambs reared is so much rent paid, and Tom Wooly thinks it worth trying for. The first prize man receives a couple of sovereigns for rearing 300 lambs from a flock of 236 ewes, and the second for rearing 144 lambs from a flock of 130 ewes. In another class, 150 and 270 lambs were obtained respectively from flocks consisting of 106 and 210 ewes. These and other awards were all decided before Friday, but the prizes for ploughing had to be that day competed for. To the farmers' sons or pupils were offered two silver cups of various values, and money in twelve amounts to the 88 ploughmen who made trial of their skill. The work was worthy of the reputation of Bedfordshire. There surely must be some virtue in the air of the district, which gives the men a clearer vision, a firmer nerve, and a finer perception of the beauties of the straight line. There is good work done with the same identical plough in other counties, but nothing equal to what one invariably sees at the Bedford meeting. Of the fourteen prizes offered in all classes, eleven were gained by men using the Howards' iron wheeled-plough, two by men using ploughs made by Page and Co., of Bedford, and one by a man using a Ransome's plough. The judges said they never had greater difficulty in making their awards, so little difference did there exist between the merits of the various rivals. The Messrs. Howard exhibited their steam tackle upon a field near the show-yard. The small show of stock took place in a paddock near the London and North Western Railway Station, belonging to Mrs. Ward; and if the yard had a fault, it was that of being a little too large for its contents. As a whole, the animals exhibited were very good; not much, however, can be said for the cart geldings, save that for the Midland counties, which are not famous for horsebreeding, it was fair. Mr. Hartop, of Keysoe, and Mr. Horsell, of Oakley, were successful. The two-year-old fillies showed very well—a strong good class, in which, perhaps, a little mistake was made in the award of the second prize. The first prize filly, a neat, clean, active stepper, to which qualification she owed her honours mainly, was bred by the exhibitor, Mr. Charles Howard, who excels in his stable as he does with his herd and his flock. Mr. H. Littledale, of Kempston, also showed a superior animal. The prize offered for cart stallions, exhibited on the 4th of April, was accorded to Mr. Manning of Elstow, but is surely not a good representation of the class of horses which should be sought for this county. The breeding mares with foals looked well, and Mr. J. Walker's first prize mare was just the mould for the purpose. The yearling colt class drew no prizes. The Shorthorn classes were all exceedingly good, and show the attention which has been given to this important breed. The two prizes for aged bulls were awarded respectively to Mr. T. E. Pawlett, for the 2nd prize bull at Battersea, 2 years and 2 months old, and to Mrs. Treadwell, for one bred by Col. Pennant. In the next bull class (calved since January, 1862) Booth blood won for Mr. Pawlett the 1st and 2nd prizes; and a very promising animal, bred by the exhibitor, obtained for Mr. Howard a commendation; by the 2nd Duke of Thordale: he wants another year to develop him. The class of six was commended. The cow class, containing 10 entries, was strong and good. Many of the specimens would throw lustre on the "Royal" show-yard, such as the white cow, of great substance, shown by Mr. Robinson, of Clifton

Pastures; Mr. T. E. Pawlett's, with her graceful outline, and slightly light forequarters; Mr. Hythes' beautiful cow, bred by Mr. Strafford, which obtained the attention of the judges; and Mr. Charles Howard's Lady Selina Spencer, which at the age of 5 years 8 months is the mother of six living calves, having but two days before the show dropped the 6th. This is specially noticeable as being the mother of the Leeds prize bull, and is a cow of great substance and quality. Mr. Robinson and Mr. Pawlett ranked first and second in the heifer three-year-old class; and Mr. Robinson and Mr. Edwd. Lawford, of Linsdale, in the very fine class devoted to in-calvers not exceeding three years in age. The same two exhibitors were again successful with two years old heifers, but changed places with each other. Mr. Lawford's heifer took him far before the rest of his competitors, though in the same class containing six entries there were certainly four that would have shown well against the best of the country. It was this heifer that won the cup at the Aylesbury Meeting as being the best animal in the yard. Mr. Chas. Howard obtained a commendation with a promising 14 months heifer. The next class contained six calves, all distinguished; whilst the first and second prizes were gained by the progeny of the 2nd Duke of Thordale, for his owners Messrs. J. Robinson and Charles Howard. Amongst the fat cattle was exhibited a wonderful beast of "unknown age," and "unknown breeder," the property of Mr. Rd. Checkley of Brogboro'—a decided Hereford strain being visible. The weight was estimated at 200 stone. The animal will, no doubt, be heard of again.

The sheep were less worthy of note than is usual at the Bedford meeting. The prize for Downs went to Mr. Charles Howard; for long-wooled sheep, to Messrs. George Street, R. Newman, W. Cranfield, and Charles Barnett; and for cross-bred sheep, to Messrs. Thomas, James, and H. Littledale. Of pigs, Bedfordshire evidently needs a better supply, if one is to judge from the pens shown on the 2nd. It would not be amiss if the breeders were to pay their respects to Mr. Wainman. The sort of pig which seems to be fashionable is the white, of middle size.

The special premium offered for hunters, by Mr. Thomas Barnard, brought out six very good animals, which were tested in a very practical manner by one of the judges, a well-known member of the Oakley Hunt. The prize was awarded to a smart, well-bred four-year-old chestnut gelding, by Rochester, dam by Gilbert Gurney, exhibited by Mr. Macan, of Elstow. Good handling had given him a clear advantage over Mr. Gibbins's Lancaster, by Hesperus, which, but for inferiority in this respect, and the want of ease, cleverness, and grace, which nice handling produces, would have run the other harder for the honours of the day. Mr. Battam, of Lidlington, also showed a good useful black gelding by Rochester. Amongst the extra stock a Brahmin cow and heifer, bred by Her Majesty the Queen, and exhibited by Messrs. J. and F. Howard, excited some attention.

The Dinner was held at the Swan Hotel by the river side, under the presidency of Lieut.-Col. Higgins, who was supported by Lord Charles Russell, and Mr. Hastings Russell, M.P., together with the county and borough members; all taking part in the proceedings, which lasted till half-past seven o'clock. The company was large, and much was said about the absence of the ladies that will lead to their admission on another occasion. The topic of most importance, and introduced by various speakers, was that of cottage accommodation; and Mr. Twitchel spoke very well on this point. The feeling of the meeting was evidently unanimous in favour of viewing cottage accommodation as a landlord question; at the bottom of which lay the *Law of Settlement*. Before any satisfactory reform can be effected, union settlements must take the place of a system which is

fraught with injustice and immorality, and which our best men for the last eighty years have been trying to sweep away. Steam Cultivation was of course alluded to, and Mr. Howard Reed was called upon to explain the object of the General Steam Cultivation Company; while Mr. James Howard spoke at some length and with great warmth, concerning the change

which the introduction of railways had wrought in the town of Bedford, and the great increase of trade. Reference was made by one of the borough members to the malt-tax, and it was considered that the arguments now to be produced were sufficient to induce Mr. Gladstone to abolish this burden, or at least to qualify its oppressive influence.

THE DUC D'AUMALE ON ENGLISH FARMING, LABOURERS' COTTAGES, &c.

At the Vale of Evesham Agricultural Society, the noble Duke, who possesses large estates in the fertile vale which gives the name to the society, and who is much esteemed there as an excellent landlord and friend to the farmer, delivered the following speech, in giving (as chairman) the toast of the day:

I must confess that I feel some embarrassment; for, although I have been very much interested in agriculture, and although I have tried to observe its state and what are called its characteristics everywhere that I have been, I cannot present myself to you as an agriculturist, and, at the same time, you all know that I am a foreigner. I cannot, therefore, speak to you with the same degree of authority as would the noble peer or the honourable members of Parliament, or as many of the gentlemen I see around me who are connected with the neighbourhood by long family, political, or social ties could. I am utterly unable to display the knowledge of a practical agriculturist; so I will address you as a foreigner, but, let me add, as your sincere friend and well-wisher. Gentlemen, first of all, that art which is the profession of most of my hearers cannot be carried on all over the world by the same process. Climate, laws, customs, the temperament of the population, its wants and means, and the division of property must have, and necessarily have, a great influence over the way in which man works the land, and draws out of it the innumerable products which are given to us by the munificence of our Creator. From the nature of your climate, and your geographical position, you have been induced to apply your energies and your skill principally to two great points, which are, the growing of corn and the breeding and feeding of animals. No doubt there are some exceptions to this rule; but I think I am justified in saying that the two great aims of English agriculturists are the production of meat and bread. These are the two great objects you have had in this direction, and you have pursued them with the tenacity which is one of the characteristics of your race. In this you have been well served by circumstances, and you have reached a degree of advancement which may be, and certainly will be, carried farther, but which is not generally surpassed out of these islands. It is for this reason that your agriculture is the subject of study and attention to many foreign economists and practical men. A friend of mine, M. de Lavergne, has given a very good description of your agriculture in a work entitled "*L'Agriculture Anglaise*," which has been translated into English; and an account of your agricultural experiments and meetings is periodically published in French. Gentlemen, I will try to point out some of the features which seem to strike more particularly foreign visitors to this country. The first is the nature of your farm-buildings, which are strictly limited to what is necessary, and are much less extensive than those that would be required abroad for the same extent of land in the same state of cultivation. I believe this practice is a wise one to pursue, for it saves a great amount of capital, which can thus be more profitably invested. However, on this chapter of buildings there is an improvement which is much required, and which has recently been much discussed—I mean the dwellings of your labourers. Although the rural population in this country are upon the average better fed, better clad, and better lodged than in most other countries, it is very certain that in many places the cottages of the labourers have not been improved in proportion to the improvements made in the landlords' mansions and the farmers' houses. I am happy to say that in this neighbourhood, however, much has been done in this direction; but much still remains to be done. To increase the welfare of the agricultural labourer is one of the purposes of this society, and as it is an object worthy the attention of

the landlord and the tenant, and as it must be in the end profitable to both of them, I believe it is an object worthy of your careful and constant consideration. Another fact which rather surprises the foreign economist in this country is that the land should have been brought to the high degree of cultivation that it has been when in many parts of the country it is held under tenure at will, and without any very distinct agreement between landlord and tenant; but if there is a deficiency in that respect, I think you have it supplied by that mutual trust and confidence which happily exist here between the various classes of society. However, success has not made you deaf to the calls for improvement. The question of landlord and tenant right has very often attracted your attention, and has been more especially brought under your notice by one of our friends, in whose judgment, experience, and fairness we have the greatest confidence. I hold in my hand the proposed form of agreement which has been prepared by your special committee. I am not called upon to give an opinion on the subject of the various clauses of the proposed code, but I believe that any arrangement which may be found practicable, and which may induce a larger outlay on farming, and increase the safety of the investment of capital in farming, is a step in the right path. The code may introduce some more complications than the mere verbal or common written agreement; but improvements often make complications. Is not the rifle with which your soldiers are armed a more complicated thing than the old "Brown Bess?" The steam-plough on your farms—the various implements now used on your farms—are certainly less simple than the *arabais* which *Virgil* so beautifully describes, and which I have seen at work, just as it is pictured by the immortal author of the *Georgics*, under the lofty olive trees of Sicily, or through the plains of Algiers. I have named the steam-plough, and this brings me to another point—I mean the application to agriculture of industrial and scientific means. I read the other day an excellent speech made by Sir William Armstrong, at Newcastle, in which it was stated that England produced 84,000,000 tons of coal last year, which represented the labour of 100,000,000 horses, and horses too which did not require to be fed. I hope that every year agriculture will claim as its own requisite a larger proportion of that immense self-feeding productive power. It is by taking a larger share of that unmeasurable force that agriculture will be able to increase its produce and fulfil these increasing demands upon it which are the result of the industrial activity of the day, and of the progress of universal welfare, that it will be able to keep pace with industry on the track of progress, for the benefit of mankind. The use of steam power and of artificial manure answers a double purpose. Where hands are deficient they supply the deficiency. Where hands can be easily obtained, and where there is no lack of capital, I think it is admitted that the use of steam increases rather than decreases the demand for manual labour. Then with the help of man's labour and capital it gives the means of drawing out of the land an increased produce, for which in the present state of trade, industry, and commerce outlets will always be easily found. When I consider what progress has been accomplished in the last 50 years, and since the adoption of a proper course of cultivation, I am rather induced to believe that if a large additional productive power be made use of, the result will be a more constant employment for labour, more profit for the farmer, and even in the long run, which we won't forget, higher rents for the landlord, and more property for the rest of the community at large. As regular institutions similar to this society, which by a peaceful assimilation stimulate the prosperity of all classes, and afford an occasion for the exchange of opinion, I am glad to say that

they now exist in many places abroad, and that they have been attended with success and the happiest results. There is a circumstance connected with these undertakings which I may notice, and which is peculiar to this country—I mean the entirely unofficial character of the meetings. You manage for yourselves here your own business. You do not require any superior assistance or interference, and I believe that upon the whole the advantages of this system are greater than its disadvantages—if there are any disadvantages. I heard the other day of a meeting that was held in a place of which I like better to talk than to name, at which a friend of mine who was presiding said something which did not answer the purpose of a high official, and who was suddenly stopped in his speech by the tremendous beating of drums. Happily, nothing of that kind is to be found in this country, for if any one trespasses beyond the boundaries of his oratorical rights, you perfectly well know how to bring him to order. But, as I have said before, laws and customs cannot be the same everywhere; still, I hope that upon these points your example will be followed more and more every day. I trust that everybody will become more and more convinced that the first necessities of agriculture are peace, security, and liberty. Gentlemen, the life I have led has accustomed me to be a good deal in the open air, and I like to go through your fields and follow a covey of birds, wild as they are, and I venture to gallop sometimes after the hare or the fox over your hedges and ditches and your heavy clay. And when I see a good piece of turnips or mangolds I like it the better—not because I know that the birds will lie better, but because I see good husbandry. And at a time when the scent is good and the hounds will run, when I feel under the hoofs of my horse good elastic ground, I am glad, because I know that the clay has been burnt and the land drained. When I have to clear, instead of a blind fence, a good clean ditch and a well-trimmed hedge, I am certainly pleased, not only in having a safer ground before me, but because I notice the improvement in agriculture. And when at luncheon-time, or during a check, I meet with a nice cot-

tage or a commodious farm-house, it is not only the pint of cider or the glass of sherry which soothes my thirsty soul (laughter), but it is the sight of the happiness, the comfort, and the hospitality shown by the cottager or the yeoman which cheers my heart. Well, gentlemen, I hope that every year I may meet in this neighbourhood with straighter fences, cleaner ditches, better-drained land, finer cattle, more comfortable cottages, and happier people; and it is because I believe this Society has promoted, and will promote all these improvements, that I offer you my best wishes for its prosperity and success. So, gentlemen, I fill my glass with what I may call, and I am proud to call, the agricultural produce of my own merry and beloved land. It is a produce which Worcestershire men, with all their skill, cannot grow in their fields. I now fill my glass, then, with what I may call a genuine countryman of mine own, and I drink to the prosperity of the Evesham Agricultural Society.

His Royal Highness, who spoke with great fluency, concluded his very elegant address amid great cheering.

Mr. HOLLAND, M.P., responded to this toast, and in the course of his remarks briefly alluded to the topic of the dwellings of the agricultural labourers. He expressed his opinion that it was absolutely necessary, now that they had implements that required more skilled labour, that they should have a more intelligent race of labourers, imbued with self-respect, which self-respect they could not attain under their present condition. He traced the history of the labourer from his boyhood, and showed how the want of home accommodation drove him to the beerhouse, and how the crowding of families of all ages into a common sleeping-room must lower the tone of morals in the class. He thought landlords should not look to a large direct return in rent for their cottage property, but that they should consider the indirect advantages which these cottages afforded to an estate in having the supply of labour close at hand and under direct supervision.

THE "TIMES" ON THE MEETINGS OF AGRICULTURAL SOCIETIES.

It is no discredit to our Agricultural Societies, but rather the best possible proof that they are fulfilling successfully the objects of their institution, that a certain sameness should characterize the speeches at their annual meetings. So long as English farmers were behind their manufacturing neighbours and their foreign rivals there was plenty to talk about on these occasions. Not only was there a whole list of grievances to be paraded and lamented, but there were real and obstinate differences of opinion upon what are now received truths. So obvious a fact as the importance of applying science to agriculture was then an open question, and the enlightened chairman of an Agricultural Dinner could dwell upon the economical advantages of steam power and systematic drainage, with a certainty of conveying instruction to his hearers, and with some prospect of being contradicted. The oratorical resources of paradox are no longer at the disposal of country gentlemen. Such elementary lessons as once passed for hard sayings would now be received with a smile, and an encouragement to emulate the enterprise and skill of capitalists engaged in trade would be felt to be almost insulting. The most adroit president of an agricultural society can but congratulate its members on their past achievements and urge them to persevere in the same path. Better cottages, a still larger outlay on farm buildings and implements, more steam engines, more oilcake, more artificial manure, better trimmed hedges, cleaner cut ditches—such are the only improvements which he can suggest, and these improvements are nothing but the extension of processes already familiar. Great credit is due to Mr. Bentinck for having found and utilized a dormant, if not a new topic for agricultural disquisition, in the "want of representation for the rural districts." Perhaps this was going a little beyond the province of an association which eschews politics, but it had, at all events, a spice of significance in it. Other

speakers at these meetings, less alive to the political wrongs of the country than Mr. Bentinck, and less capable of making good bricks without straw than Sir E. B. Lytton, have been sadly put to it, and some have been unable to get beyond Virgilian praises of agriculture and thankfulness for the late abundant harvest.

The Vale of Evesham Society was fortunate in getting the Duc d'Aumale to preside at its anniversary last week. Few of the illustrious exiles who have made England their home from time to time have commanded such general respect as the Orleans family, and of this family there is no member more deservedly popular than the Duc d'Aumale. His knowledge of our language and literature is remarkable, and without losing the characteristics of a French Prince he has appropriated in a rare degree those of an English gentleman. It was in this capacity, and as a considerable Worcestershire landowner, that he occupied the chair at Evesham, and certainly no county nobleman could have acquitted himself more gracefully. There is always something of novelty and interest in a foreigner's view of habits and institutions. The gift of seeing ourselves as others see us is denied to nations, as it is to individuals, and what seems to a native trivial and matter of course is seen by an observant foreigner in a different and more suggestive aspect. The best pictures of life and manners are seldom drawn by those who belong to the class from which the materials of them are borrowed. The characters of Sir Roger de Coverley and Squire Western were conceived and delineated by Londoners, and that, too, in an age when the communication between town and country was far less complete than at present. The best account of the agricultural state of France in the same century was written by an Englishman, Arthur Young, who is said to have first opened the eyes of Frenchmen to the imperfections of their own husbandry. If the Duc d'Aumale attempted a humbler

task in his address to the Worcestershire squires and farmers, he was able to point out several peculiarities in our system of farming which may be new to many of us. One of these is the less ambitious scale of our ordinary farm-buildings as compared with those in France; another is the perfection to which cultivation is brought without the security of leases or definite agreements between landlord and tenant; a third point, on which the Duke touched with much good taste and feeling, is that which has excited so much attention, not to say anxiety, among ourselves within the last year or two—the dwellings of our labourers. The more this painful and difficult question is considered, the more it will be found to lie at the root of others which have too often been discussed without reference to it. We almost fear to take as much credit to ourselves as the Duke is disposed to give us. When he says that "the rural population in this country are upon the average better fed, better clad, and better lodged than in most other countries," we cannot forget that we must make a large allowance against ourselves for the exigencies of climate, or that a much larger per-centage than we like to think of are in receipt of parish relief. What is certain is that their cottages and general condition "have not improved in proportion to the improvements made in the landlord's mansions and the farmers' houses" that the standard of comfort among them is still too low for the requirements of decency and morality; and that neither the self-interest of the landlord nor that of the labourer can be trusted to work out a remedy. Whether the causes of the prevailing evil are spontaneous or the result of legislation, whether they are to be sought in over population or in the law of settlement, it is plain as it well can be, that neither the laws of political economy nor acts of Parliament are by themselves adequate to cure it. The existence and disgrace of it must be brought home to the conscience of the nation, landlords must be stimulated to do that as a duty which cannot be shown to promise immediate pecuniary returns, and they will surely find that they have a profitable investment, if not for their own benefit, yet for that of their children.

It was scarcely possible for the Duke, in noticing the spread of agricultural societies on the Continent, to refrain from alluding to that which invariably strikes foreigners as an English peculiarity—the absence of any official initiative. Perhaps it was not quite fair to tell the story of the chairman in France whose voice was drowned by the beating of drums, at a signal from a high functionary, when he was about to utter something unpalatable. It is natural and excusable for one who has lost so much by the Empire to stigmatize that as a vice of the Imperial régime which has, in fact, been the vice of all régimes that have successively prevailed in France. De Tocqueville has shown that the tendency to excessive centralization and bureaucracy in France, which had been traced to the Revolution, was really an inheritance from the old Monarchy. Strange as it seems to us that the art of acting for oneself and managing one's own business should be unknown in any civilized country, the fact notoriously is that it is hardly understood out of England, and has never been practised in France within modern times. Nor must the advantages of the opposite system be denied. There can be no doubt, for instance, that if a Board of Agriculture had been established when the great impulse was given to practical science in the latter part of the last century, some of our inventions and improvements would have been anticipated by many years. Adam Smith describes the farmer and peasants of his own time as actually superior in intelligence to the manufacturers and operatives, and yet for want of incentives and aids to progress which the dwellers in towns always enjoy, they were contented to go on for two generations sailing, as it were, by dead reckoning. Great, however, as the waste of power was, and paralyzing as was the influence of war prices and protection on the energy of our farmers thus left to themselves, the reaction has been more than proportionate. Future historians will speak of the advance in agriculture which followed the repeal of the Corn Laws as more marvellous than the development of the cotton manufacture or the coal trade, and it will be remembered that this advance dates from the period when the influence of competition was first felt by the farmers.

THE HOLY ALLIANCE OF AGRICULTURE AND MANUFACTURES.

At the Warwick Society's meeting, the wedding of agriculture and manufactures was celebrated anew, the Earl of Warwick giving away the bride, and Mr. Newdegate acting as "best man" to the iron bridegroom.

His Lordship said that the more agriculture progressed, the more it allied itself with the manufacturing districts, and worked together with them in one common cause, so much the better for the agricultural interest itself, so much the better for the community at large. Improvement had been very great in all descriptions of agricultural machinery, and there was scarcely a year in which fresh inventions were not brought to light. At the same time that they supported the manufacturing interest, they trusted and believed that manufacturers looked upon them with feelings of friendship and good fellowship. It was the hearty wish and desire of agriculturists to pull together with the manufacturers in one common cause, that cause being the interest of Great Britain. Some time ago he observed that, at a large and important meeting in the north, a noble duke, speaking of the progress of agriculture, made use of the remarkable expression that there was in almost every animal and vegetable a new creation. There could be no doubt that the improvement was most striking when they compared the magnificent animals exhibited at such shows as this, with the unfed, uncultivated animals which formed, as it were, the raw material. So, likewise, when they compared the magnificent samples of wheat and grain shown at the various markets of the country with the wretched weed from which it probably originated; but, at the same time, they must be careful not to be too presumptuous, and to fancy that the hand of man could accomplish everything; for, they must ever bear in mind that, though man labours, it is God who giveth the increase, and that one

night's frost, or one day's storm, might render utterly nought all that man could do. It was their duty, therefore, to use all those means which the intelligence of mankind placed at their disposal, and to trust to a merciful Providence for its successful result.

LORD BERNERS said, societies such as the present were in reality founded in the affections of the people; for, whether he spoke of labourers or tenant-farmers, there was scarcely a man among them who was not proud to belong to an association of which their landlords were members. He was much gratified to witness the marked improvement in the cultivation of the land of this district since he had an opportunity of visiting it some years ago—a result which was to be attributed to the impetus which had been given by this society, and also to the visit of the Royal Agricultural Society, thus showing that the advantages conferred upon any particular locality by the visit of that valuable association were of a permanent description; and he hoped that they would continue to remember the motto of that society, which was "Science with practice." It was their desire to discover what was the right thing to be done to improve the breed of stock, and render machinery more available in agriculture; and, having done that, to make the results known to farmers. It was on that ground that they had done all in their power to encourage steam ploughing; and he was much gratified to hear that some spirited farmers in that district had united together for the purpose of obtaining a steam plough. He hoped that in a short time they would see steam cultivation introduced in the same way as threshing machines and other implements had been. He could speak from his own experience that it was impossible to clean some descriptions of land without the use of steam cultivation. Furthermore, if

they wished to raise the character, habits, and moral and intellectual qualities of the labourers, nothing they could do would tend so much to accomplish that object as the introduction of steam cultivation.

Mr. ANDERLEY said he could the better testify to the value of agricultural associations, because the period he had referred to—twenty-two years—was just the period in which they had taken root in this country; and directly after their first establishment they succeeded, and, rapidly multiplying, soon extended throughout the length and breadth of the land. It was just as he entered the House of Commons that agricultural societies and farmers' clubs began to take root and spring up in this country under the pressure of evil times, when the farmers found that if they would live they must set their shoulders to the wheel. And he thought that all persons would admit, judging by the results of that and kindred societies, that they had succeeded in their efforts, and had raised agriculture to the level of the times. They had, by combining together in associations of this kind—associations in which a spirit of competition was an important element—so improved the cultivation of the land, that they might be said to have vied with the manufacturers in calling in the aid of machinery. At the time to which he referred, manufacture was rampant, and was stimulated by all the resources of capital and invention, and agriculture was struggling; but, in process of time, agriculture so competed with manufactures, that she became, as it were, a manufacturer herself; and, if anyone would desire to carry the science of agriculture a step higher, he must plough by steam and reap with the aid of mechanical invention—so much had these societies done to promote the progress of agriculture by the adaptation of machinery to its various operations. But, although all classes had been benefited by this improvement in agriculture, none had received so much benefit from them as the labourers themselves. Skilled agriculture required skilled labour, and skilled labour invariably raised the status of the class which supplied it. Not only did the introduction of skilled labour enable the agricultural labourer to work himself up in the scale of society, but it also tended to increase his general intelligence; and, in this way an enormous advantage had been reaped by the labouring population from the establishment of agricultural societies. He took it upon himself (and he had had some experience in reference to the question of education) to say that more had been done by the introduction of skilled labour to improve the education of labourers, and

to raise them in the scale of humanity, than all that the Privy Council had done with its annual millions voted by Parliament. The general result of their labours, then, had been to combine agriculture with manufactures; and it was one of the greatest advantages which the society conferred, that it gave the landlords and farmers, the employers and employed, the agriculturist and manufacturer, an opportunity to mix together at their annual meeting. Thus it was that they had seen in the exhibition yard every kind of interest represented. Even the horse interest was represented; and one of the most attractive sights of the day had been the hurdle racing for the trial of horses, which seemed to have interested persons of all ranks. In like manner, they had the cattle interest and the machinery interest, as exemplified in the exhibition of agricultural implements. But the finest feature of the exhibition was to be found in the people themselves who attended it. Talk of the improvement of breed! why the race they themselves represented (the men and women—the old Anglo-Saxon race) were the best breed in the whole world! If it were not for the vigour of the Anglo-Saxon race, what would become of a meeting like the present? No other country in the world had such self-action and such vigour about it as to be able to hold such meetings as we did, and which had been of the greatest advantage to the country. It was the absence of a too enervating climate, too unclouded skies, and a too luxurious nature, which produced so vigorous a race of people, and which rendered us so superior to all the world.

Mr. NEWDEGATE said he could not but rejoice at what seemed to be the co-partnership that had sprung up between agriculturists and manufacturers. They were now applying to agriculture steam—that great power of modern times; and they were determined that, in that respect at least, the manufacturers should have no monopoly. The agriculturist in North Warwickshire had long ago felt a friendship for the tall chimneys which marked the out-crop of their minerals, and had learnt to lament when they stood vapourless, for, in their case, a cloudless sky was but too often a sign of departed prosperity. The nationality of feeling which now existed was most marked, and that nationality had been called out mainly in consequence of the distress of the manufacturing interest, which had called forth the noblest efforts of charity that had ever been made. He thought that the present state of the country, flourishing as it was, compared with almost every other country in the world, was a recognition of Divine Providence, for which we ever ought to feel grateful as a nation.

HOW TO MAKE A PRIZE AGREEMENT.

It may be remembered that about this time last year Lord Lichfield made an offer of a premium of £50 for the best form of farm agreement, and that, in doing so, he evinced a deal of commendable consideration for the joint interests of the parties to be concerned in the contract. A judicious advocacy of tenant-right principle was, in fact, the leading feature of his lordship's address; a point which, it might be fairly assumed, would not be without its effect on the competing compositions hereafter. The announcement of this prize created some sensation when just fresh before the agricultural world, whilst the object has since received the best practical support from the number of papers forwarded for perusal. It will be only right however, that Lord Lichfield should himself be allowed to tell the story, as he did the other day, when presiding at the dinner of the Staffordshire Agricultural Society. The absolute necessity for some attention being called to the matter is well put, as, after a reference to the labours of the Parliamentary Committee of 1848, his lordship proceeds with this introduction to the name of the successful competitor: "I must say that although the agreement which has been fixed upon to receive the prize is not more likely to be perfect than any other human production,

it is an agreement which is likely to be acceptable to the great majority, if not to all the landlords and tenants in this county; and I should, indeed, be dissatisfied with the results of our meeting, if I did not think that; for what could possibly be the use of this agreement, if it were not generally adopted? An agreement is wanted in this county not only because security is required for the increasing amount of capital which is yearly laid out, or which ought to be laid out upon the land, but more especially because you have no custom of the country to fall back upon." This is all very sound, and further on his lordship states how far the prize agreement promises to meet or supply the exigencies of the district: "I may tell you that it contains certain clauses which give security to the tenant for unexhausted commercial improvements. It also provides for a certain system of cultivation, which, although it presents no difficulties in the way of restrictions, can safely be said to give encouragement to better farming. For instance, it provides that land at the 'quitting shall be left in a proper condition'—and so on, altogether in as encouraging a strain as one would wish to hear. The actual results of the offer are then duly given: "The competition was

thrown open to the whole of the country, so that anybody might have sent in a form of agreement. In all 47 were sent in, and I need hardly say that these 47 included every form of agreement which could well be imagined; nor need I say that the labours of the committee in wading through some of these agreements were very considerable. Every description of clause, every description of provision was contained in these agreements; but the successful one was drawn up by a gentleman who is well known in this county as an agriculturist—Mr. May, of Elford Park. I am sure it will be satisfactory to Mr. May and everybody in this room to hear that there never was any difference among the committee as to who should have the first prize." In a word, nothing would seem to have been more thoroughly successful than the framing of Lord Lichfield's offer or the response made to his challenge. There was a deal of competition, but still with one agreement indisputably superior to all others, "including every form which could well be imagined;" and this one is of course to be circulated forthwith, if not read out there and then in the Market Hall at Stafford. But my Lord shall himself play out the play:—"I think it is just possible that I may give some little disappointment when I say the Committee are not about to publish that agreement!" We should really think his Lordship might, too; but he "will tell you the reason why." Because, amongst other good causes, "I really think from what I have seen of it that it will require very little alteration indeed!" But still, "It was utterly impossible for any agreement to have been drawn up by any single individual which was likely to be so perfect in all its clauses as to be acceptable to all the landlords and tenant-farmers in the county. There are certain points of practical detail still to be supplied, and"—How does the reader imagine these practical details are to be supplied? By publishing the agreement in its present form, and asking for certain suggestions as to its amendment—by calling a meeting of the agriculturists of the county, and discussing the form, clause for clause—by returning it to the author, and requesting his attention to any weak place—or by strengthening this or that, with permission, from some of the many other agreements received? Not a bit of it! "The Committee have agreed amongst themselves to keep together until they have made the Agreement what they think it ought to be, and, before they publish it, to have the *advice of some agents upon the subject*." That is to say, to have the heart of the prize Agreement cut out of it by sundry anonymous land-agents, who will twist it, and turn it, and trim it, and cut it, and tone it, and worm into it such points of practical detail, as will most probably turn the whole thing into a mere farce, and negative all the good that Lord Lichfield may have ever intended. But this will never do, to tack so wretched an ending on so good a

beginning. Let the Committee at once announce the names of the land-agents they propose to call in. Let them hereafter publish not only their own form of agreement, but that as *originally* drawn by Mr. May, and let them append their own names to their award; for already the country is teeming with dissatisfaction and suspicion. In the *Staffordshire Advertiser* of last Saturday, "One of the unsuccessful Forty-six" asks: "Was, or was not, the successful competitor a member of the committee who sat in judgment upon the agreements and awarded the prize? Was it not known from the first, to at least certain members of the committee, that he had sent in a form of agreement? Was he not present at meetings of the committee when his own and other agreements were considered and discussed? Was he not in communication with members of the committee upon the subject? For the interests of justice and the credit of all concerned, these points ought to be cleared up." The *Advertiser* says in a note to this letter, that "Neither the successful nor any other competitor was a member of the sub-committee which awarded the prize;" but who were the members of the sub-committee? for it will be absolutely imperative now to know them, in order to clear up the whole matter from the awkward mystery surrounding it. Another competitor, signing himself "Inquirer," protests against the decision of the committee, for "What has been arrived at? The committee have disposed of Lord Lichfield's fifty pounds, and got a writing which requires certain points of practical detail, and when they have had the *advice of some agents upon the subject, they will make the agreement what it ought to be!*" Is this the essence of competition? Is it proposed to cull from the 46 other agreements (or those the committee waded through) such conditions or stipulations which the 'advice of some agents' may recommend, or in what manner is the Prize Agreement to be made 'acceptable' to the landlords and tenant farmers of the county? It is a grave question whether the sub-committee has not far exceeded the authority deputed to it? while it is another grave question for the county to consider whether the agriculturists are really safe in the hands of gentlemen who hand their case and cause over bodily to the land-agents? We hope, as we believe, that Lord Lichfield had no part in thus defeating his own declared intention. It would be really well to see a Prize Agreement as coming clean out of the hands of the tenant farmer; but if this is to be clipped and cut into shape like a prize sheep, we must have no more of this hole-and-corner business, but every man concerned must put his name to his handiwork as publicly as Mr. May. The agreement will, in fact, be no longer the production of the latter, but of the Committee and the Land-agents.

THE PRIZE AGREEMENT.

At the recent dinner of the Staffordshire Society, the President, Lord LICHFIELD, thus spoke to the subject of land tenure, in announcing the winner of the £50 offered by his Lordship for the best form of agreement:—"While I am upon the progress of the society, I cannot help alluding to another point, in which its progress is wholly undisputed—a point which the founders of the society—my friend Lord Harewhey and others—must have had in view, because they not only desired to increase the quality of stock and other produce, but they desired also to increase the knowledge which landlords, tenants, and labourers brought to bear upon the duties of their several positions. I believe that in nothing has the society been more successful than in this, and to prove this I think I need not go further than the society's own report for 1848, where I find the committee stating that they had some mingling as to whether the introduction of the subject of the tenure of land

would promote the real harmony and welfare of the various classes connected with agriculture. This year we find the society endeavouring to bring landlords and tenant-farmers openly to the discussion of this very question. I believe that up to the present time this has been one of the most difficult questions which has attended the progress of agriculture, and it is one that, as I have already told you, this society found to be a difficult one. This difficulty has met those who have undertaken it in other counties; and that, but not least, the legislature of the country has experienced the difficulties which attend it. At one time they attempted to deal with this question, and after a great deal of investigation and after the examination of almost everybody who was capable of giving them any information upon the subject, they came to the opinion that it was utterly undesirable for the legislature of the country to interfere in any manner between the owner and the occupiers of land. At the same time that they made

this enquiry they published a report, which, while it pointed out where such interference was undesirable, also pointed out in what particulars such interference might possibly be brought about, though without in any way deranging the mutual agreements made between the two parties. In this report they recommended an Act, which was afterwards passed and which gives security to tenants for outlay upon buildings. That has been the only result of the deliberations of the committee which sat so many days, and took so much evidence. That Act gives a tenant power to obtain payment for the buildings which he may erect upon a farm during a tenancy, or else to remove them. There is one point with regard to that subject which I cannot help touching upon a little, because it may require the attention of those who have undertaken to deal with this subject. The committee said they believed it to be possible to enable the owners of property, who have only a life interest in that property, by their act to give security to the tenants, by means of a mutual agreement. I allude to this because it is well known that the object I had in view, when not long since I offered a prize of £50 for the best agreement between landlord and tenant which could be drawn up, was, to give that security which was absolutely necessary for those tenant farmers who might choose to spend capital in improving the land which they occupied. That was my main object in proposing to give this prize, but at the same time all present must know that while such security is necessary for the tenant it should also be accompanied by clauses protecting the interests of the landlord. At the time that I felt such an arrangement might be made by a mutual understanding between landlord and tenant, I was quite aware that the greatest security which perhaps could be given to the tenant, and that which many of them would prefer, would be a lease which would ensure their holding their land for a greater number of years, and for a sufficient number of years to enable them to recover the capital laid out upon it. But I could not at all disguise from myself the fact which I knew to be a fact, that, although in the minds of many a lease was preferable to an agreement, there were not only many landlords, but many tenants, who objected to the system of leases (No, no). Therefore I felt that so long as it was possible to obtain an agreement which would give the security required, it was of the utmost importance to the country that such an agreement should be obtained. I must say, sanguine as I was at the time I first raised this subject, that the discussion of it would be of vast service both to landlords and tenants, my expectations have been very much more than realized. That has been brought about through the very fair, reasonable, and attentive consideration which has been given to the subject by the committee which has sat to adjudicate upon the prize. I am certain I speak the opinion of every landowner on the committee when I say that the mere fact of our having met together on so many occasions, and discussed all the points which could arise between landlord and tenant, has supplied the landlords on the committee with a vast amount of valuable information, quite independently of any agreement which came before them. And I have no doubt that the tenant farmers on the committee have learnt that the landed proprietors of this country are anxious to meet them in a fair, reasonable, and liberal spirit. I must say that, although the agreement which has been fixed upon to receive the prize is not more likely to be perfect than any other human production, it is an agreement which is likely to be acceptable to the great majority if not to all the landlords and tenants in this county, and I should indeed be dissatisfied with the results of our meeting if I did not think that; for what could possibly be the use of this agreement if it were not generally adopted? An agreement is wanted in this county not only because security is required for the increasing amount of capital which is yearly laid out, or which ought to be laid out, upon the land, but more especially because you have no custom of the country to fall back upon. What you want to do here is to establish a custom, and that custom clearly must be a good one. In Lincolnshire there is a custom of the country which provides that security which you now wish to obtain in this county by means of an agreement. And I believe Lincolnshire is the only county in which such a custom does exist; and although I have never been in that county, I am perfectly satisfied from all I have heard that this custom has immensely improved the farming there and the production of the soil. I think I may now announce to the ladies and gentlemen present, because we

are all interested in this question, who has been the successful competitor for this prize. I am thankful to say that in doing so I have not to go out of the county of Stafford for a name. The competition was thrown open to the whole of the country, so that anybody might have sent in a form of agreement. Altogether forty-seven were sent in, and I need hardly say that these forty-seven included every form of agreement which could well be imagined; nor need I say that the labours of the committee, in wading through some of the agreements, were very considerable. Every description of clause, every description of provision, was contained in these agreements, but the successful one was drawn up by a gentleman who is well known in this county as an agriculturist, and that gentleman is Mr. May, of Elford Park. I am sure it will be satisfactory to Mr. May and to everybody in this room to hear that there never was any difference of opinion amongst the committee as to who should have the first prize. I am not aware, but I think it is just possible I may give some little disappointment when I say the committee are not about to publish that agreement; and I will tell you why. Because, as I said before, it was utterly impossible for any agreement to have been drawn up by any single individual which was likely to be so perfect in all its clauses as to be acceptable to all the landlords and tenant farmers in the county. At the same time, the committee felt that this agreement, by a little more consideration on their part, and a little further prolongation of their duties, might be so presented as to make it very likely that it would be generally adopted. I really think, from what I have seen of it, that it will require very little alteration indeed, but there are certain points of practical detail still to be supplied, and the committee have agreed amongst themselves to keep together until they have made the agreement what they think it ought to be, and before they publish it to have the advice of some agents upon the subject. But while I say we are scarcely prepared to publish the agreement as it stands, I may tell you that it contains certain clauses which give security to the tenant for unexhausted commercial improvements. It also provides for a certain system of cultivation, which, although it presents no difficulties in the way of restrictions, can safely be said to give encouragement to better farming. For instance, it provides that land at the quitting shall be left in a proper condition; and I do not think there is anybody who is likely ever to be placed in the position of an in-coming tenant, and there are many landlords already tenants, who will for a moment say that is an unwise provision. On the contrary, it is clearly absolutely necessary, not only for the interest of the landlord and the in-coming tenant, but also for the prosperity of the country generally, that the most should be made of the land, and that not even for one or two years should a farm be thrown out of condition. We all know perfectly well that when once a farm is thrown out of condition, it takes a very long time to get it into condition again, and that, in point of fact, most practical farmers will tell you, if you ask the question, that they would rather pay a considerable sum of their capital down than at a low rent go upon a farm in bad condition. I think one of the reasons why at this time additional security should be given to a tenant for such sums as he, with the consent of his landlord, may think right to lay out in the improvement of his farm, are the improvements which are rapidly taking place in the cultivation of the land, which involve a constantly increasing capital. I would only take the instance of steam cultivation. Now, there is no sort of doubt that extraordinary improvements will be the result of steam cultivation. Although there is a difference of opinion as to the amount which is to be allowed for wear and tear, and also as to the increase of produce which will result from steam cultivation, there is a universal opinion by all who have tried the system, that it is undoubtedly successful. His lordship then expressed his regret at the comparative failure of the steam plough which he introduced upon his estate some time since, and said that before steam ploughing could become general, great alterations must be made in the shape of the fields; and this showed the necessity of tempting additional capital on to the land. He next referred to the subject of labourers' cottages, and said, with some emphasis, that he knew estates on which the cottages were in a bad condition owing solely to the negligence of the agents. He did not believe there was a single landed proprietor in the county who would not remedy evils of this nature if they were pointed out to him.

NITROGENOUS MANURES, WITH SPECIAL REFERENCE TO THE TURNIP CROP.

Some few years since, the Loughbro' Agricultural Association had a special meeting. The members, impressed with the importance and value of a knowledge of chemistry to those engaged in agricultural pursuits, met for the purpose of considering how to provide such an education for their sons and at the same time to make some progress themselves in this science—a knowledge of which, to the farmer of the present day, is almost imperative. After some discussion a fund was raised, and it was decided to engraft an agricultural branch on the old-established Grammar School. Mr. J. Scott was appointed master, and also lecturer on chemistry to the association. On Thursday last he addressed the Society on "Nitrogenous manures, with special reference to the turnip crop." The following is the substance of the paper:

What used to be called the nitrogen theory has now, I imagine, but few supporters. This theory was that the soil needed only manures with nitrogen in them as the principal substance, in order to produce the most abundant crops. The nitrogen theory was strongly supported in this country by Lawes and Gilbert, and so strongly was it taken up by them that it became a hobby with them, and they wrote and said many things in regard to it, which, of course, could not be confirmed, and thus laid themselves open to criticism by the opponents of the theory. Its most bitter opponent is perhaps one of the most eminent of chemists, and taking advantage of the one-sidedness of Lawes and Gilbert's experiments, he has written a most bitter treatise upon the subject, and certainly spares not these two men. Liebig has written long in opposition to this theory, and maintained for many years as extravagant opinions in another direction. He maintained that there is no necessity to supply nitrogenous manures at all to the soil, if we take care to supply plenty of the other substances needed by the plants for their sustenance. Plenty, he said, of this nitrogen floats in the air to supply all that is needed to vegetation. He has, however, modified his opinions in his last treatise on the subject, and admits that manures with a supply of nitrogen are necessary to produce the large crops now demanded by the farmers to pay expenses. For the natural produce of the soil it was not necessary to supply these manures, but for the artificial produce now demanded it is necessary to resort to all classes of manures in order to accomplish that end. Lawes and Gilbert have been obliged to modify their extravagant opinions as well, and admit that mineral manures alone will sometimes give a large increase of crops. For my part, the longer we live I think we shall the more clearly see that all such theories must fall to the ground. It is impossible under the existing state of things, that any one theory of manuring can satisfy all. There are no two fields the same, far less two farms, or the soils of two counties. What will suit one farmer won't suit another, so that nitrogen theories or mineral theories must both alike be laid aside as antiquated. We must, to be rational, study for ourselves what our fields require, and then persevere in those principles, and we shall at last have good crops from no grudging land. Nitrogen manures, to inquire a little into the subject, are plentiful in the market, but generally costly to purchase. Guano is the principal source of nitrogen to the farmer; and it is a curious thing that, though he does not refuse to pay a good price for guano, and principally for the nitrogen contained in it, yet he allows as much nitrogen to escape out of his manure-heaps, and from other refuse, as what he purchases in the costly manure. It is a sort of a paradox that as much as £11 or £12 should be paid for guano, yet there is generally lost as much valuable matter, by exposing the heaps to the weather, and allowing other refuse to waste. It is, I think, questionable whether nitrogen is then of value to the farmer, or whether it is the most active ingredient in guano. It is quite true that there are other most valuable matters in guano, and some that up to a recent period had never been so much as estimated, and are now found to have a most beneficial effect upon it—that is, the oxalic acid, in particular, that is found in it. Yet experience shows that the nitrogen of the guano plays a most important

part, and is certainly a most valuable manure to those who are determined to make the land produce its utmost. Then why do farmers lose so much by allowing refuse of all kinds to waste so extravagantly? I fear we cannot commend the wisdom of those who do so, and must turn a deaf ear to those who complain of hard times, and yet husband not that which would enrich them. I know quite well that vast reformation has been wrought in this matter within the last twenty years; but the work is only half accomplished, as long as the nitrogen is allowed to escape. Being, as you know, in its usual state, a volatile compound, it requires to be corked up to keep it from loss. Clay is a good cork, and prevents its escape entirely out of all refuse. The thing is easy enough, I consider; but I must not enter upon this point again, seeing I have spoken upon it before, and likewise that my theme leads me to-day in another direction. I have principally to direct your attention to the effect nitrogenous manures have upon the turnip crop. The battle, in this instance, is between phosphorus and nitrogen. Now, to understand the difference of their action, and of the principle of manuring with these two substances, it will be necessary to explain. Phosphorus, in the shape of superphosphates, or in bone-manure of some sort, can only be applied to the land. It does not exist anywhere else but in the manure or in the soil. Now nitrogen is in the atmosphere as well as in the soil; and plants in a natural state withdraw all their nitrogen from that source, and the plants in that state are able just to assimilate as much nitrogen as they need, or the other kinds of food from the soil feed the plant just at that rate at which the nitrogen, for its part, can be extracted and assimilated from the air. But in any given plant, whose growth we wish to hasten on, and whose produce we wish to increase, we must force it to take more food in a given time, and provided all the kinds of food are present in the soil in sufficient abundance to give the most abundant crops, yet our plant will not grow at the desired pace, unless we provide more nitrogen than the plant can get in its natural growth. And here comes the necessity for the supply of nitrogen in order to give the plant a good digestion, to put it in homely phrase. Let plenty of other mineral food be in the soil, ready to be taken up by the plant, and then give a supply of nitrogen; and you are sure to have an abundant crop. There is no reason beforehand, why we should so supply nitrogen; and [Liebig reasoning from theory, and not from experiment, argued that we need not, on that condition, supply nitrogen, since sufficient existed in the atmosphere. But we reason from experiment, and say that if you do not supply nitrogen the plant will not grow, though all the other conditions are favourable.—not so well, that is. We state nothing absolute in agriculture, there are so many exceptions. Experiment must decide before theory. The theory must come out of the experiments, and we must not make a certain number of experiments in order to work out a favourite theory, for surely in that case, will facts be twisted and perverted unconsciously. On the other hand, if we supply nitrogen to a poor soil, the plants will decidedly be greater in bulk and the produce will be more abundant. But then the power of the nitrogen has been exerted upon the original elements of the soil, and thus by constant manuring with nitrogen manures you come sooner to a complete state of exhaustion in the soil than otherwise. And there is another danger in using nitrogenous manure alone in quantities, that is, if the field is not particularly rich. The nitrogen operating upon the small amount of fertile substance in the field at the first offset of the plant causes the plant preternaturally to arrive at an advanced stage of growth, when almost suddenly the growth of the plant ceases, and the powers of the soil are unable to perfect its growth in a sufficient manner. A diseased or imperfect plant is the consequence. And we have instances of that frequently with the turnip. It grows rapidly at first, assimilates the total amount

of some one substance in the field that is at all in a state for feeding the plant, for instance, lime and magnesia; then the growth of the plant is continued with the other substances for a time, but the soil being wanting in one essential element, the plant's growth necessarily becomes less vigorous, insects of various descriptions attack it, and disease of course is the consequence. Let us be sure first that the soil is in good heart before we apply a strongly forcing manure, lest "finger and toe" manifest itself in the field, and we turn blindly round and blame the manure applied as the cause of the disease. Then again, the quantity of nitrogen put upon any field has been the cause of much dispute. This point was experimented upon last year by the East Lothian club of farmers. The quantities applied varied from 4 to 8 per cent. per annum, and the conclusion arrived at was against the application of such large quantities. One gentleman, the most enterprising of the club, was against this decision, and determined another year to apply the maximum, and only remember to put it on a good field and give his turnips plenty of room to grow; the drills at least 27-in. wide, the plants 3 or 4 inches more distant from one another in the drill than usual. Now, I imagine that as much as 8 cwt. would frighten many of the farmers in this district, and I think it would be unadvisable to try it. The climate differs to that extent as to produce such a dose of guano on the lands here. But I often think that the principle is a good one that Mr. Hope advocates, that is, of giving the turnips plenty of room to grow. Drills 27-in. wide, and the turnips well thinned out, gives, according to the statistics of the north, always greater weight to the acres than those where the roots are thick in the ground and of small size. I think it is well to take no grudging view of these matters. If we are liberal to the fields, I always imagine that the fields will be liberal to us. This thin planting is gaining ground rapidly amongst us, and I consider it a step in the right direction. If you are in the habit of reading Meehi's speeches, you will see there that thin sowing and thin planting are quite the fashion, and large crops as the result. He argues specially in wheat, because of the peculiarity it has of tillering well when thin sown. And we would argue for thinly-planted turnips, when we know that there is really no limit to their size. And swedes never lose weight by growing, as the common turnip does. But then we must remember that these principles are limited by climate, as we saw the other day when Meehi was lecturing the Cumberland farmers, and applying to the high and bleak lands of Cumberland the famous principles in operation at his farm in the more temperate climate of Essex. The Cumberland farmers knew well that Meehi was right for Essex, but knew equally well, and told him as plainly, that he was wrong for Cumberland. In this district the climate is temperate and good, and we can follow out these principles, I am sure, with advantage. If we sow the turnips crowded together, then we are sure to get a crop, but not the weight nor the quality of that crop obtained from thinly-planted turnips. And especially is this so with nitrogenous manures. It was a point that I wished to direct the experiment this summer upon. And I asked several of those who were so good as to try the experiment to thin one part to a greater extent than the other. I hope they have attended to it, and we shall see the result afterwards. Nitrogenous manures demand wider spaces than superphosphate, for the crops grow to a later period of the year with the former than the latter, and are therefore more likely to increase to a larger size. The time of planting the turnip is a point of considerable importance, especially if taken in connection with the season and manure applied. Every district must be ruled by its own laws in this respect. To be made aware that in Scotland they sow in May and reap good crops of turnips in November, will serve no good purpose for this district, as this summer I fear will abundantly prove before it is done. But so great is the influence of the season, it is almost impossible to arrive at anything like a satisfactory explanation of the whole facts of the case. Two diseases, however, are the result of early sowing—one rather peculiar and more noticeable on soils in which there is a considerable quantity of organic manure, or on land richly supplied with nitrogen. The turnip grows in this particular instance with an overabundant top and a proportionately less-developed root, so that in time the weak root becomes diseased, a fungus very like the mould of the potato settles upon the fibres of the root and destroys them.

Now, nitrogenous manures have always a tendency to develop the top more than the root, and where such a disease as this is liable such manures should be studiously avoided. If the season is warm and forcing, as this last season has been, there is still greater danger from this disease. From what I have heard of some fields of turnips in this neighbourhood, I fear they are attacked with this disease, and since no land in this district has an overabundance of organic matter in it, I must conclude that this special disease is in this season, owing to the crops growing on land abundantly supplied with nitrogen. And then the most virulent and common disease, resulting from early-sown turnips, is that of mildew. It generally attacks the crop about the end of August or beginning of September. Such a summer as we have had, has made turnips peculiarly liable to this disease, for this reason—that the hot moist weather in June set the turnips vigorously to work; they grew well during July; but when August appeared, still dry and hot, the growth of the plant ceased, owing to the continued drought. When the growth ceases, a curious fungus, called *oidium*, fastens upon the leaf, and causes that white appearance upon it known as mildew. There is no help for the disease when it once appears, save the return of rain to give sufficient moisture to start the growth and wash the leaf. And even this return of rain and favourable circumstances won't save the crop, if the rain does not come before the fungus has eaten into the fibres of the plant. Prevention is better than cure. Late-sowing prevents mildew to a great extent; as well as in the months of August and September, keeping the surface of the land between the drills well stirred and pulverized, to be ready to absorb moisture from the dews at night, and which would sustain partly the continued growth of the plant. Late-sowing can always be practised by every farmer; and in this district, where mildew does attack the crop, it must be allowed to be the safest plan. It is almost distressing now to look upon fields, that in the beginning of August had a first-rate appearance, to see them blanched and withering. If the season had been cold and retarding, the early-sown turnips would not have suffered to the same extent. But as it is, they are suffering; and those who sowed late in the season may thank themselves for their precaution. There are so many influences at work which affect the growth of this plant, that it is impossible to be concise and certain in any of our speculations regarding it. We have the soil to consider, the manure to consider, and, above all, the season, whether dry and warm, or wet and cold. The two first we can influence: the last we cannot. We must take the season as it comes. Our best plan is to go on perseveringly to work, to discover the most probable conditions of soil and manure, and ascertain the time when to sow; and having these conditions fulfilled to the best of power, we must then leave the growth of the turnip to the influences of the weather, be it rain or be it sunshine. Mr. Scott concluded by remarking that he must say ammoniacal manures had this year, in most instances, produced more abundant crops than superphosphates, owing principally to the warm season we had. In cold weather superphosphates would be best. Turnips were less liable to mildew when grown with ammoniacal manures than with superphosphates, as the former kept them growing longer in dry weather.

The CHAIRMAN said he was sure Mr. Scott was worthy of their best thanks for his most instructive lecture, containing so large an amount of practical information expressed in so intelligible a manner. He observed that he had seen astonishing effects from a dressing of salt and guano, about 3 cwt. of guano and a portion of salt. Last year some land in his parish thus manured produced an enormous yield of turnips, and it bid fair to be quite equal this year, and would most likely obtain the Society's prize.

Mr. SCOTT said the guano and salt dressing seemed to answer best of all the experiments which were being tried.

Mr. W. HANSON observed that his turnips looked remarkably well. He had sown the guano and salt on the flat, and then drilled the turnips in.

Mr. ANGRAVE thought it was best to ridge twice—ridge and then dress with guano and salt, and afterwards ridge again and sow the turnips.

Mr. ROWBOTHAM said the season had certainly been peculiarly favourable for ammoniacal manures, but as a rule he did not think nitrogenous manures were good for turnips, but nothing was better for corn crops. On his land, which was rather cold, he used 2 cwt. of guano, 3 cwt. of salt, and 3 cwt.

of superphosphate; he dare not use superphosphates alone. With reference to the waste of manure by exposure, he remarked there was a difference of opinion. Voelcker and others contended it did not waste much by evaporation, but only by draining.

The CHAIRMAN wished to know Mr. Scott's opinion as to whether a manure heap would really lose large by evaporation, or whether it was only the draining of the liquid.

Mr. SCOTT replied fresh manure did not waste much by

evaporation. The ammonia was produced by decomposition, and was generally washed down by the rain. But he did not, he said, refer in his paper so much to manure heaps as to other farm refuse. He directed attention to an article in the Royal Agricultural Society's *Journal*, on the appropriation of town sewage. He thought they might learn much from it which would prove valuable to them. The adoption of the writer's suggestions would get rid of what had for a long time been a difficulty and a nuisance, and turn it to a real benefit and source of gain.

PRODUCTION OF NITRATES, AND THEIR APPLICATION IN AGRICULTURE

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

Whilst calling the attention of our readers to a new method of fertilising the soil, which derives its source from the wonderful discoveries of modern chemistry, permit us to render sincere homage to the merit of those savants whose theoretical works and experimental researches have brought to light the finest discoveries of the 19th century.

Agriculture and Manufactures, the two great forces of nations, have obeyed in practice that energetic impetus, and the light has spread itself from one hemisphere to the other.

Chemistry, Physiology, Mechanics, Botany, Geology, and Astronomy, all followed in marvellous progression, not only in the fixing of abstract principles, which form their base, but further, and, what is of greater importance, in their application to all works which constitute the well-being and prosperity of nations.

This homage we would particularly address to MM. Dumas, Boussingault, Liebig, Payen, Malaguti, Johnston, Kuhlman, Barral, Lecq, Béron, Lawas, Gilbert, Isidore, Pierre, Voelcker, Way, and Pusey. It is to modern chemistry, and agricultural chemistry especially, that we owe for the most part the progress that has been made; and amongst which we may mention first the production of nitrates, as regards the application which has been made of it, for the last four years, in fertilising the soil.

Happily we are able, after numerous experiments, to arrive at the day predicted by M. Malaguti, in the following words, quoted from his "*Lectures on Agricultural Chemistry*:"—"The cultivator will one day be able to fix the azote in the atmosphere himself, and transform it into the nitrates which constitute one of the most powerful manures."

In order the better to set forth the importance of the subject we propose to treat in this paper, we shall proceed to relate our practical experience of a summary of the principal works upon the theory of nitrification.

In 1740, Pietsch, in his address before the Academy of Sciences at Berlin, mentioned the circumstances which appeared to him most likely to favour the process of nitrification. They resolved themselves into four essential conditions: 1st. The presence of lime; 2nd. The porous nature of the soil allowing free passage to the air; 3rd. The putrefaction of animal and vegetable matter; 4th. A certain degree of heat and moisture.

In 1779, Rochefonsault and Dolomieu observed that chalk became nitrified in the air. "I think," writes Dolomieu, "that the discoveries upon the generation of saltpetre might well instruct us upon the principles of vegetation. To put a soil to its fullest yielding powers, and make it most valuable, do we anything more by our multiplied labours than present successively to contact with the air the different parts of that soil? We introduce some animal and vegetable matters in a state of putrefaction; mix with a soil which is too clayey and tenacious some calcareous marl—all successful means for obtaining nitre. Again, there is no soil in full bearing which does not give nitre by washing. From that, might we not infer that one of the principles of vegetation, in fact one of the principal causes which puts it in action, is that same nitrous salt, the generation of which it now remains for us to discover? We might further follow this analogy between the means of producing saltpetre and those which are used for rendering a soil most fertile. This simple glance must suffice to make some observations relative to that double object,"

In 1778, Clonot and Lavoisier stated that the task of lime of Touraine and Saintonge nitrified very easily.

In 1782, Thouvenel carried off the prize at the meeting of the Academy of Sciences at Paris, and remarked that chalk placed in a basket, under which was put some putrified blood, produced a notable quantity of saltpetre.

In 1784, Cavendish showed that nitrification required the contact of an alkali in solution.

One of the most remarkable facts which has been observed by M. Dumas, is that if we cause a mixture of ammoniacal gas and air to come in contact with chalk at 100 degrees, it will immediately form nitric acid in large quantities.

M. Boussingault proved very recently, in a paper read at the Academy of Sciences, in Paris, "That a part of the organic matters of dung and manures produced nitrates in the same manner as that of the artificial saltpetre beds."

Manufacturers from the commencement of the last century availed themselves of the facts pointed out by these savants, and very soon some artificial nitre beds were formed for the purpose of extracting saltpetre destined for the making of gunpowder.

Amongst the chemists who were most interested in these experiments, we may mention Chaptal, who, in his "*Chemistry applied to the Arts*," described in the following terms the construction of artificial saltpetre beds: "Take the most porous chalk soil, mix it with straw, washed; form it into triangular or oblong heaps, by raising successive beds of soil and dung; then water it with a mixture of pure water, saltpetre, and purin."

In making this experiment ourselves, we placed the dung under shelter from the rain, and there alternately sprinkled it with marl and watered it with purin, which, always thrown into the same pit, constituted a mixture of pure water, saltpetre, and purin.

It appears to us that the present manner of proceeding is precisely the same, only we obtained a larger quantity of lime-matter which, in an agricultural point of view, is of more value even than either nitrate of potash or nitrate of soda.

The results which we now present to our readers are only an application of the facts pointed out by chemists, who, after the example of the illustrious Davy, have lighted agriculture with the torch of Science.

Happily we have now realised the problem of artificial nitrification applied to the improvement of manures in some practical experiments made upon our farm—Britannia, near Ostend.

The dung was placed over the mouth of a pit of purin, covered by a thin roofing of pitched board supported by upright planks. The dung was divided into three equal parts. The first was formed of farm manure, trodden by the feet of the cattle, and regularly watered with purin; the second part was not pressed, but regularly watered like the first; the third was disposed and treated just like the second, only every layer of dung was sprinkled with pulverised marl, in the proportion of from two to three per cent. of the weight of the manure. These three beds of dung were kept for three months in that condition.

The soil chosen for testing the relative values of these manures was of a clayey nature, of uniform quality, and measuring about a hectare. It was divided into three equal parts.

each of which received the same quantity of manure to the value of 80,000 kilograms per hectare. The manure was put on at the commencement of May, and it was no sooner buried than we sowed summer coles over the whole three divisions of soil. The following are the results obtained upon the three lots during four years successively:—

FIRST LOT.—Farm dung covered, trodden down, and watered with purin; treated like manures in the generality of rural farms:

1859. Summer coles	Crop satisfactory.
1860. Australian wheat	Fine crop.
1861. Clover	Two abundant cuts.
1862. Clover	(One cut as an experiment) vegetation poor.

SECOND LOT.—Manure not fattened; watered with purin:

1859. Summer coles	Crop satisfactory.
1860. Australian wheat	Fine crop.
1861. Clover	Two abundant cuts.
1862. Clover	(One cut as an experiment) vegetation languishing.

THIRD LOT.—Farm manure not trodden; watered with purin, and sprinkled with from two to three per cent. of its weight of pulverised marl:

1859. Summer coles	Vegetation vigorous.
1860. Australian wheat	Infinitely superior vegetation to the two preceding lots.
1861. Clover	Two cuts of splendid growth.
1862. Clover	(One cut as an experiment) vegetation sustained.

The increase of produce obtained annually in the third lot may be valued upon an average at ten per cent. above that obtained on the two other plots.

What conclusions are we to draw from these experiments? That in regions where the land contains clay, we can resort to the easy and economical process of the formation of artificial nitre; that the result of that process is, to give to manure a quicker and more durable action, thereby producing an increase of ten per cent. of fertility.

We have stated that these experiments were made upon a clay soil; would they have been as successful had the soil been sandy? M. J. J. Vavinckerooye, the talented cultivator at Hasselt, thinks (and we are of the same opinion ourselves) that by stratifying the farm manure with two to three per cent. of dry clay, conjointly with two to three per cent. of pulverised marl, we might obtain upon sandy earths a nitrification closely allied to that produced on clay soils solely by the use of lime added to the manure not pressed. We shall be happy at some future time to prove this new and important result.

The experiments on nitrification that we have made upon manures not covered have also given good results, only the nitrates were obtained in smaller quantities, and form more slowly than when the dung is sheltered from the rain. This question we submit to the examination of our scientific men, merely remarking that thermometrical variations, differences of climate and seasons, exercise great influence upon the production of nitrates.

Our first notice, "Nitrification of the Soil," of which this forms the supplement, was published some months since in the principal agricultural journals of Belgium, France, England, and Germany, and provoked some observations, which the *Journal d'Agriculture Pratique* published under the direction of M. Barral, summed up in these words:—"We accept the remarkable facts obtained by M. Bortier on his farm Britannia; only it would be necessary to determine by chemical analysis the presence of nitrates in the manner which had produced most effect, in order to be able to show the causes of the success obtained. It would also be interesting to make an experiment in which the lime was added at the moment of spreading; but this experiment, which requires to be continued and generalised, is not the less interesting now."

The chemical analyses that we now publish, will give full satisfaction to M. Barral; they are due to M. Donny, Professor of Practical Chemistry, at the University of Ghent. "These researches prove," says M. Donny, "that the work of nitrification really does operate in stratified manure beds, such as those which have been established at Ghistelles; but they also show that the results may vary in a notable way, not only by the species of lime used, but even by the different

manner of operation." These experiments show further that, conditions being equal, the Cipley marl produces infinitely more nitrates than that of St. Omer. In fact two experiments have been made; the one by placing 100 grammes of Saint Omer marl, mixed with farm manure, and watered with purin. All these substances examined separately before the experiment contained no appreciable traces of nitre. After two months' stratification, the 100 grammes of Saint Omer marl, analysed by the Schloessing process, furnished 0.05 grammes of nitric acid; and the 100 grammes of Cipley marl 0.08 gr., which corresponds nearly to a production of nitrate of lime 0.07 gr. from the St. Omer marl, and 0.012 gr. from the Cipley marl. Other experiments made by M. Donny, on the subject of nitrification of manures, show results which may be of great practical importance.

These results seem to lead to the belief that nitrification presents some analogy to that category of chemical phenomena which takes considerable time to manifest itself, but the progress of which becomes so rapid from the moment that the action declares itself in any portion whatever of the mass.

It was in this way M. Donny remarked that the quantity of nitrates produced in a given time by a mixture of stratified manure and chalk might be considerably increased by the addition of a very small quantity of plaster from old walls by way of nitrification. Thus we had, stratified with farm manure, as in the preceding experiment:—1. 100 grammes of Cipley marl. 2. 100 grammes of the same lime, to which was added 5 grammes of plaster from old walls, in which analysis had proved the existence of 0.062 gr. of nitric acid. After two months' action, the sample prepared with chalk only, gave by analysis 0.069 gr. of nitric acid, and the sample with plaster in addition 0.23 gr.; subtracting from these 0.23 gr. of nitric acid the 0.062 gr. which the plaster previously contained, there remains 0.168 gr. of nitric acid formed during the experiment; that is to say, a quantity nearly triple that formed by the simple mixture of calcareous matter and manure.

If these results had been confirmed by more extended researches, they would have been rich in practical facts; and the employment of nitrified manures would be useful, not only on account of the fertilising matter which they bring ready formed to the soil, but also by stimulating that species of natural nitrification which is constantly operating in all fertile soils. They will prove one day how numerous are the chemical phenomena provoked by fermentation, and how great are the riches drawn from it by the fine experiments of M. Pasteur. In the meantime it is fortunate for us that we are able to give, as the result of these analyses, an estimate by that eminent chemist upon the phenomenon of nitrification.

M. Donny proved, as we have seen, a very notable increase of azote in the manure stratified with pulverised marl, and thus explains the increase of the produce obtained upon the soil which had received the nitrified manure. This superiority appears to be kept up even to the approaching harvests for fifteen years onward; and this fact ought to astonish us the less, because the soil under the influence of manure becomes in its turn capable of nitrifying itself, as was proved by experiments.

To the last question presented by M. Barral, Whether marl added at the moment of spreading would not produce the same effects as mixing it with the dung in the pit? we reply that comparative experiments denote a marked superiority in favour of manure sprinkled with pulverised marl at the time it is put into the pit.

We cannot conclude this notice without calling the attention of agriculturists to the Cipley marl, in which M. Donny remarked a peculiar disposition to nitrify; so that we from that time abandoned the St. Omer marl for that of Cipley.

M. Le Hardi de Beaulieu, the eminent economist and former Professor of Mineralogy at Mons, introduced to our notice the Cipley marl, the deposit of which is indicated with mathematical precision upon the beautiful geological map of M. Dumont. The learned professor of Liège designates it under the name of *Calcaire à Polyptère*. M. D'Omalon D'Halloy, in his remarkable work "Geology of Belgium," the fruit of fifty years' study and research, gives us a detailed description of the three beds of *Calcaire à Polyptère* possessed by the Belgians—Cipley, Folx-les-Caves, and Limbourg. We find in the excellent work of M. Binkhorst van den Binkhorst, "Geological and Paleontological Sketches of the Cretaceous

eous Beds of Limbourg," a perfect indication of the *Calcaire à Polyptères*. This work gives us further a chemical analysis of that lime, which we have completed in a point of view, so important in agriculture, of the presence of phosphates in marls. The following is the analysis of the marl:—

Carbonate of lime.....	96.00
Carbonate of magnesia.....	1.46
Phosphate of lime.....	1.10
Peroxide of iron, alumina, and silica	1.44
Soda, traces.	

100.00

Richness in carbonate of lime, porousness, friability, presence of phosphates, and traces of soda—such are the qualities of the Ciple marl.

M. de Gasparin seems to have had before his eyes the *Calcaire à Polyptères*, when, in his "Progress of Agriculture," he thus expresses himself:—"The pulverable marls afford azote; sometimes they contain nitric acid; and it is evident that it is by their surface and their efflorescence they become susceptible of being charged with the elements of fertilisation; the exterior agents only acting upon the marl and forming nitrates by the surface."

This theory is confirmed by a learned professor, M. d'Archiac, who, in his "History of the Progress of Geology," writes thus:—"We collected at Folx-les-Caves a large quantity of saltpetre, and used it then in the wars of the Empire." Now it is precisely at Folx-les-Caves, one of the three beds of *Calcaire à Polyptères*, that we wish to speak for a few minutes. If saltpetre has already formed naturally in the *Calcaire à*

Polyptères merely by atmospheric influences, in what proportions may not that same saltpetre be produced when we aid its formation by the processes indicated by science? The great facility of that marl to nitrify, justifies us in designating it under the name of *Nitrifying Marl*.*

The *Calcaire à Polyptères* is of recent formation, and is generally found over the white chalk. All geologists are of opinion that Europe only possesses three beds of it, situated in Belgium, extending to Holland. These beds are considered inexhaustible; and, thanks to the facility of communication, we can partake with France, England, and Germany of this precious element of fertilisation. And what use do we make of the *Calcaire à Polyptères* now? None; except that at Mons they use it as a sort of pumice stone for cleaning kitchen tables!

Had not M. de Gasparin, therefore, reason to say, "There is not one agricultural fact, nor one process of art, which may not become the object of researches as curious as useful; not one which, by some happy discovery, may not change the aspect of arts and manufactures?"

It is our mission to point out to agriculturists the benefits which the industrial arts offer to us; and, examining the artificial nitrates which Prussia, Moravia, and Sweden possess, have we not a right to say, What efforts have not been made to collect saltpetre for gunpowder? The time is come now when the cultivator must in his turn create nitre beds, not for the purpose of making destructive compositions, but as elements of fertility, bringing with them prosperity and abundance!

P. BORTIER, Farm Proprietor.

FECUNDATION OF CORN.

The *Moniteur* publishes a remarkable communication on this subject from the pen of M. Daniel Hoolbrenek, whose success in the management of fruit-trees at Chalons we have already had occasion to notice. After some observations on artificial fecundation in general, M. Hoolbrenek enters upon his subject by premising that every agriculturist is well aware of the nature of the soil he has to deal with; whether he is to sow earlier or later, thick or sparingly, &c. Generally speaking, it is as well not to sow too thick, in order to allow the future plant more space, so that the leaves may develop themselves freely. This is why sowing in autumn is preferable to sowing in spring, because during the four or five months which the leaf has at its disposal by the former method, when it sprouts before winter sets in, it has full leisure to acquire strength itself, and the root and stalk likewise. The first leaves are intended to prepare nourishment for the ear; for there are two principal periods in the life of the corn plant—first, the production of the root, the leaves, and the stalk; and, secondly, the formation of the ear, which derives its aliment from every part of the plant previously formed. It becomes strong, if the previous elaboration has proceeded well; and weak in the contrary case. Hence, it is in the interest of the future ear that the development of the leaves should be favoured as much as possible. Numerous experiments made by our author show that, so long as the organs of the leaf are in an imperfect state, it only derives its nourishment from the soil; while, on the contrary, when all its organs are well developed, it borrows a number of new and important elements from the air. To verify this our author has exposed plants to artificial atmospheres containing sulphur, arsenic, or other poisons. The plants whose organs were perfectly developed immediately absorbed the poison, whereas those in an imperfect state were very slow in taking the poison, and sometimes would not take any. Young shoots will not absorb any; but old plants will with great ease and promptness. It is to increase the vigour of the leaves that the field is rolled while the corn is still in a herbaceous state. Our author recommends fluted rollers for this purpose instead of smooth ones; only in that case care must be taken to roll always in the same direction. Fluted rollers have the advantage that they bend the stalk without flattening it down, and in this inclined position it transmits much more nutriment to the germ than in its erect position. There is also

another advantage, viz., that the flutes leave so many grooves on the soil, which detain the water on the spot, and prevent its being rapidly dissipated. They also act as a harrow would, by breaking the crust which is usually formed at the surface of the soil after a heavy rain. Now, when all the labour of the field is over, there is still a risk to run, and that is, a bad flowering season. When the flowering does not proceed satisfactorily, a portion of the crop is generally lost, and this is the countryman's risk, which is beyond his control; all he can do is to watch the work of Nature carefully, and endeavour to improve his chance, whatever it may be; and this is the chief purpose of artificial fecundation. Now, it is not always easy to know at first sight when corn is in flower or not; on going along a field in one direction one is often induced to believe that it is not in flower; and on going down in the opposite direction one finds, on the contrary, that it is in full blossom. This is owing to the fact that those parts of the ear which are exposed to the south and east flower earlier than those exposed to the north and west. Now, it is a general rule throughout the vegetable world that the pistil is always much sooner ready to receive the pollen than the stamens are to yield it. Moreover, the pistil is much more sensitive than the pollen. Rain, fog, hoar-frost—nay, the smallest insect on the pistil, will prevent fecundation, since these accidents displace or destroy the small drop of honey which makes its appearance at the top of the female organ, in order to receive the pollen. When this drop has disappeared, no quantity of pollen can produce any effect on the pistil. Pollen, on the contrary, is so hardy that you may preserve it for seven or eight years without its losing its fecundating property in the slightest degree. As in other plants, so also in corn the embryo is much more perfectly fecundated by the pollen of another stamen than by that of its own. All these principles receive their practical application as follows: A coarse worsted fringe is attached lengthwise to a rope, which should not be more than 30 yards in length. The threads of the fringe are about half-a-yard in length. Two labourers placed opposite to each other keep the

* A specimen of this marl, and the manure which had produced the nitrification, was exhibited in the London Exhibition of 1862; and these samples were mentioned in the official catalogue, page 180, under the title of "Preparation of Nitrates of Lime."

rope stretched across the field in such a manner that the ears only touch the fringe, by which they are shaken and made to wave, while the two labourers walk on, maintaining the rope parallel to the position it had at starting. A third labourer, placed at an equal distance from the other two, meanwhile takes hold of two sticks stuck into the rope at its centre, and moves the rope horizontally from right to left and back, so as to make the fringe work like a saw, which causes the ears to strike gently against each other. By this alternate and regular motion the pollen of the stamens is dispersed, and shed indistinctly upon all the ears. If the field to be fecundated is too broad, paths should be left, at distances of from 25 to 30 yards, to allow the labourers to go in a straight line. The threads of the fringes may be loaded at intervals with grains of buck-shot, in order to give it more weight, and thus favour the alternate motion. The operators may, if they please, beset the fringe with a little honey at intervals, whereby some atoms of pollen will adhere to it, and may be transported to other ears. The operation above described should be performed in fine weather, and the proper moment should be selected by observation, according to the principles above explained. Thus, the artificial fecundation ought to be begun by going as much as possible from east to west, because the side of the ear turned to the east is always fecundated before the others. Then, two or three days later, the fringe should be carried across from west to east. Again, that none of the later ears may be exempted from the operation, the fringe may be car-

ried about in any direction three or four days later, and the field will then be thoroughly fecundated. Eighty hectares of land were subjected to this treatment on M. Jacquesson's farm in the domain of Sillery, and the results obtained per are (4 square poles) were as follows:

	Unfecundated.	Fecundated.
Rye	22½ litres 16 kilogr.	34½ litres 25½ kilogr.
Wheat	30½ litres 21 kilogr.	41½ litres 31 kilogr.

These results have been officially ascertained by MM. Payen, of the Institute; Daily, an agriculturist at Trappes; and Simons, Chef du Cabinet of the Minister of Agriculture and Commerce. Regarding barley and oats, the results witnessed by the communal authorities were, per are:

	Unfecundated.	Fecundated.
Barley	28 litres 16 kilogr.	40 litres 24 kilogr.
Oats	30 litres 11 kilogr.	43 litres 17 kilogr.

From these figures it appears that the increase of yield obtained by fecundation is about one-half, the cost of the fringe and labourers being insignificant. Only M. Hoolbreuck remarks that, as 1863 has proved a very good year, this was rather an unfavourable circumstance, and that the advantage would be much greater in a bad or middling year. Our author enters into further details, chiefly theoretical, which we must omit, confining ourselves to his closing assertion, which is important, namely, that the immense increase in the yield shown above does not exhaust the soil.—*Scottish Farmer*.

AGRICULTURE, COMMERCE, AND TAXATION.

It was a profound remark of Montesquieu that "land produces less by reason of its fertility than by reason of the freedom of its inhabitants." The same truth is expressed by the phrase, "Liberty is the greatest of all producers." There is no fact better authenticated in history than the low state of the art of culture in all centralized countries. Rural life loses its activity and energy when its free will is constrained, for the husbandman is then reduced to a machine. If he cannot think and act for himself, and profit by those changes of systems which experience convinces him would prove useful, and approve themselves to his own judgment, he is in no respect superior to the tools with which he works. If he is a man of spirit, he spurns the plough, as an instrument of his personal degradation. This was pretty nearly the normal state of agriculture in France when Montesquieu wrote, though no doubt there were exceptions; but the attention of history can only be directed to classes. It is notorious that the nobility of France abandoned a country life, and sought amusement or promotion in Paris, or in whatever town the court was held; the punishment they most keenly felt was banishment to their estates. The middle classes followed the example of the nobles; and it is remarked by M. de Tocqueville that, before the Revolution, a second generation of rich peasants was a thing almost unknown. When a farmer made a little money, he sent his son to the neighbouring town, and bought him an appointment. This aversion to rural life grew out of the restraints and indignities to which it was subjected by the central authority of the State, which simply regarded agriculture as a mine to be plundered. Therefore the cultivator was deprived of the exercise of his free will; he was subjected to forced labour and the performance of servile offices, and the only return he received was insult and chastisement. The land of France was fertile, but the rural inhabitants were enslaved; and it was this condition that provoked and justified the criticism of Montesquieu.

To this system there was one exception in one province of France, and the consequences were so remarkable that we cannot pass them by unnoticed. That province was Anjou—known in the Revolution as La Vendée. There the country gentleman had always been resident, superintending culture of their fields, paying no servile deference to the central authority, neither courted its smiles nor fearing its frowns, but assiduous in promoting the welfare of the peasant. When the Revolution broke out, those country gentlemen who had never danced attendance in the ante-rooms of Courts or intrigued

for stars or pensions, stood forth as one man to defend the Crown, and all their labourers followed their loyal example; while the decorated nobility meanly abandoned that Royalty which had loaded them with favours, and fled to foreign lands to save their lives.

The evils of a central government are easily traced, for we actually see its hand in motion. There is no screen between it and the oppressed classes. It strikes openly because it knows itself to be irresponsible, and it was this very immunity that led France to ruin, for its abuses became so gross as to provoke a resistance which engulfed monarchy in the very same grave which had swallowed up so many of its subjects. But agriculture may be gashed and maimed by deep, though not necessarily mortal wounds, by other agencies than those which formerly existed in France. The example of ancient Rome is before us. It was a great producer while its people were free, and freedom was crushed by taxation. Before the barbarians had invaded Italy, the greater part of Campania, once styled the "Happy," was reduced to a desert; and this ruin can only be referred to the administration of the emperors, since no destroying conqueror had yet crossed the frontier. Internal decay had undermined Roman power before it felt the blows of external violence. The rural population, brave, robust and patriotic, had once formed the strength of her victorious armies, but the soldier disappeared with the farmer. In contrast with the squalor of the abandoned homesteads and the uncultivated fields, Rome itself displayed the most gorgeous splendour, for the wealth of the empire was concentrated in the capital. They who might have continued to live prosperously in the rural districts, had agriculture been fostered as in the days of old, were driven into the towns, there to seek for a precarious existence; and the consequence of the system was that Rome perished amidst the riches which attracted the spoiler, and which degeneracy had not the courage to defend.

History was written for our instruction, and the lesson taught by the fate of France and Rome is that the stability of empires is founded on the conservation of their agriculture. In both those countries it was destroyed. In France all ancient institutions were overthrown, and literally levelled with the dust; in Rome, all nationality was extinguished. The circumstances that led to these tremendous catastrophes operated silently though slowly; few perceived their stealthy approach, while the few that ventured to hint at them were denounced as fools or punished as the enemies of "order."

They were referred to the grandeur that blazed forth in public, and sneeringly asked to point to any sign of decay. The fact is, man is always ready to lend a listening ear to pleasant prophecies, but remains dumb to unpleasant truths. Hence it is that the pleasant prophecies give the chief tone and hue to what is called public opinion, though they may be saturated with falsehood, and thereby nations are lured to destruction. Some temporary expedient may be adopted which leads to present prosperity, and they who feel the immediate enjoyment of that prosperity persuade themselves that it will be permanent simply because it exists. Of this kind of delusion we have now before us a sad and striking proof in Lancashire and Cheshire. The manufacturers in those districts were frequently warned that their trade was precarious because they depended on one source of supply for their raw material, and the more far-seeing among them perceived their danger; but the vast majority had no such prescience, and they continued to build machinery with borrowed money, in blind confidence that cotton would never fail their demand. The growers of the raw material were just as demented, though their madness assumed a different form. They persuaded themselves that the necessities of England had reduced her to vassalage as the bondaman of "King Cotton"; so much so, that the naval and military force of England would have to be exerted to prevent the closing of her mills. Now, to effect the great scheme of commercial policy out of which these complications have arisen, and the final results of which no man can foretell, the whole system of British finance and taxation were fundamentally changed, and adapted to a new state of things, from which a full tide of prosperity was most confidently anticipated in a stream annually enlarging in its volume. A possible want of cotton, the mainspring of all the wondrous operations that were to ensue, was never contemplated; the only anxiety was to secure fresh markets for the manufactured fabrics, for which reason we plunged into wars with China, that the inhabitants of the "central flowery land" might be civilized into a preferential taste for the products of Manchester. Thus foreign commerce became lord of the ascendant, and agriculture was lowered to a subordinate condition.

Let us pursue this narrative of facts a little further; and as the pleasant prophecies have not been realized in the Southern States of America, in Lancashire, or in China, we hope none of our readers will take offence should the prospect not appear more cheerful in other quarters. The export of cheap cotton fabrics essentially depended on the import of cheap corn; the former was to come from the southern districts of the great transatlantic republic, the latter from its north-western districts. Thus American agriculture in its two most prominent forms was to be stimulated by the looms and steam engines of Lancashire. The combination was commended for its judiciousness, and the heart of labour was told to rejoice. Then active hope carried the plough to the prairies, and the City of Chicago sprang into existence as a fairy structure, growing into vigorous manhood without passing through the stages of infancy or youth. It at once became the grand emporium of cereals, and then arose the difficulty of finding a market for the inexhaustible crops garnered from the surrounding country. As Manchester wanted China for its calico, so Chicago wanted England for its wheat, and Chicago exulted when the British ports were thrown open to its enterprise. But it soon discovered there were impediments yet to be removed. The land carriage was costly, and some successful attempts were made to get through the lakes and canals without transshipment of cargo till the vessel arrived at the quays of Liverpool. The "Dean Richmond" was the pioneer of this trade; but this line transit was only suited to comparatively light freights. Hence the adventurous mind of speculation proposed to cut a canal from Lake Huron to the River Ottawa, and then there would be no impediment to the navigation of the St. Lawrence. The civil war has postponed the execution of this plan, but it was based on solid calculations which assumed the following aspects: "The freight from the north-west to Liverpool is, on wheat, one-half of its price; on flour one-third; and on

Indian corn seven-eighths of its price." By ship canal the freight of grain would be reduced to one-fourth of the preceding figure. But what of the supply that might be expected? Here the data are pretty sure, being founded on experience. In 1861 the North-western States imported into England alone 2,507,744 quarters of wheat, 1,733,334 quarters of Indian-corn, and 8,794,865 hundredweights of flour, the whole of which are computed to have been sold in England for £12,643,918, though worth at Chicago only £4,817,567. Now not one-tenth of this corn-growing district is cultivated; hence, the incalculable advantage of the British market, and the commercial policy of cutting a canal at the comparatively small cost of four millions sterling.

He who takes truth as the pole-star of his inquiries follows its guidance, without turning to the right hand or to the left, to whatever consequences it may lead. His sole anxiety is to be clear, straightforward, and consistent in the pursuit. He dismisses from his mind all theories, all preconceived opinions, all temptations to bend evidence in support of some favourite system. Were he to act otherwise, his own conscience would convict him of willfully sustaining error, perhaps for pecuniary profit, perhaps to win a temporary popularity, perhaps to promote some miserable triumph of political party. Thus, truth might be concealed for a time, though its light cannot be extinguished by mortal devices. Now, let us assume that this proposed canal was completed, so as to form an uninterrupted line of water-carriage from the north-west provinces of America to Liverpool. What would be, or, at least, what might be the results? It appears clear that British manufactures would largely flourish, while British agriculture would decline, because its produce would be undersold; if not undersold it would have been folly to cut the canal. Let there be no mistake in this reasoning, which may be easily confused and rendered unintelligible by taking extreme or exceptional cases. If England, the recipient of north-west corn, were in the condition of ancient *Ægina* when *Pheidon*, the reputed inventor of weights and measures, was king, no native industry of a similar kind would be displaced, nor even in the slightest degree affected, for *Ægina* was barren in soil, though it contained skilled artificers fed with foreign food. They, therefore, must have starved without free import. But that is not the position of England. She is a producer of the very cereals which meet her in competition in her own markets; and then comes the question, Can she grow enough for her own consumption? Confessedly, she cannot; and, therefore, she is not only bound to admit foreign supplies, but interested in their reception. Now arises the pinch of the argument. More supplies are, on the hypothesis, designed to be auxiliary, to compensate her own deficiency. They are not designed to supersede, but to sustain her own labour. But, suppose they did supersede it, what then? Should the British plough be condemned to rest, in order that British looms might clothe the world? To which it may be answered, This is a sample of the extreme cases already condemned. It is granted, and it is only here urged to illustrate the principle here under discussion, that from it we may attempt to arrive at some practical limit. We know, beyond all doubt or cavil, that the fee simple of land in the north-west may be bought for one dollar (4s. 2d.) per acre; and, when cultivated, that it is only subjected to a scale of taxation which is nominal, compared with that which the British cultivator must pay. Deducting freight, which, with the facilities of a canal, is a mere trifling percentage on the cost of production, it is plain that the American price must govern the British price; and the problem to be solved is simply this: Where can the line of practical limitation be drawn, so as to ensure adequate foreign supplies to prevent domestic deficiency, without reducing home labour below the scale of remunerative price? That problem never yet entered the mind of the legislature, which has satisfied its laziness by a loose reliance on the formula of supply and demand, without in the slightest degree considering how supply and demand themselves are generated or affected. Hence, the collision between agriculture and commerce, and the speculative vagaries of fanciful financiers in taxation.

ANNALS OF THE ROUND TABLE.

We propose concluding our series of papers under this heading by a few observations on the dietary and household management of our unmarried farm-servants, including the Scotch bothy system, with a view to improvement. The very name *bothy* is a barbarism, indicative of its origin in the rude times of our forefathers, when the rough simplicity of such a place was considered more dignified and ennobling than the refinements of modern times. Indeed, the latter at that time would have been considered effeminating luxuries unworthy of a ploughman. But the rude huts of patriarchal times have been supplanted by stately mansions and palaces, just as barbarous notions and superstitious prejudices have been dispersed by the growing light of Science; and similarly so is the fate of our bothies, and much of that bucolic rudeness which has hitherto characterised our farm-servants, who even make a boast of many doings and sayings of which they ought to be ashamed. It must ever be borne in mind, more especially as a controversy has arisen on the cottage, kitchen, and bothy systems, that this clownish rusticity is not confined to bothies or the cottages of our agricultural labourers, but exists as largely in many other classes of society, if not in a much higher degree. Even in the upper ranks of life, much of the finery and fineness there exhibited, when examined in the light of Science, is more demeaning to the intelligence of our race (!) than is the antiquated rudeness of the bothy system of which we in the strongest language complain. To err is human, and perhaps in nothing more so than to magnify the mote in a brother's eye, without acknowledging the dimensions of the beam in one's own. In every sphere the unmarried period of life has its shortcomings and temptations, and to such our labourers are no exception. At the same time, from being located upon our farms, they enjoy many golden privileges over their English brethren who live in villages, and it is no less their duty than that of employers to cultivate these for the mutual benefit of each other.

The questions for consideration are those of dietary; household accommodation, including sitting and sleeping-apartments; and self-tuition.

Under the former of these three heads it has already been shown that the bothy system of dietary is superior to that of the farm kitchen and cottage, generally speaking, but that we by no means approve of the exclusive use of oatmeal and milk, especially in the form of "brose," as used in bothies. At the same time, we must confess that, some thirty years ago, when working hard, we have often preferred *brose*, in the morning, to bacon and eggs, tea, &c., &c. (English fare); so that this class of puddings, when properly made, ought not to be hastily despised by farmers and labouring men. Nothing would be more imprudent than to ridicule such a diet and primitive mode of cookery; for it is more than probable that, as we progress in the knowledge of practical chemistry in the culinary art, it may be found superior to more fashionable modes of making puddings. We could enumerate some dozen kinds of brose, or puddings, of this class; and the grand desideratum is, how best to increase them in number and improve them in quality. The best modes of cooking vegetable and animal food, not only for agricultural labourers, but mankind in general, have yet to be discovered; and this should be pointed out to the workpeople themselves, accompanied with the explanation necessary to make it intelligible to their more limited knowledge in the chemistry of cookery. This is all the more necessary, inasmuch as our unmarried servants, men and women, are not following the provident habits of their ancestors with sufficient attention, there being a growing proneness amongst them to spend the whole of their wages on food and clothing. Consequently, suitable provision is not now being made, as formerly, for entering married life under comfortable circumstances. The contrary of this is what should be encouraged by every possible means; for the fact is notorious that, even during the thoughtless period of youth itself, the labourers are neither so well fed nor so comfortably clothed as in the olden time, when the rustic ship carried no more sail than ballast.

Fashion may pipe, and wealthy people may dance, and even leap over each other's heads; but of all the absurdities imaginable, that of the agricultural labourer allowing himself to lose sight of the real object of his food and clothing, and to be led astray by the upper classes in this respect, is certainly the grossest and most unpardonable.

"But how," it may be asked by some advocate of the old patriarchal system of the kitchen and the cottage so touchingly portrayed by the Poet Burns, in his "*Cottar's Saturday Night*," "can thoughtless youths in a bothy be expected to improve their dietary, or study the chemistry of oatmeal puddings, cookery, &c., &c.?" so as to be able to solve the problem why horses cannot maintain their muscular and nervous energy in the chase or race-course so well on any other kind of corn as the oat, thereby proving at the same time the parallel case why Scotchmen are such sturdy fellows on brose, and why the Caledonian lyre so rapturously sung—

"O, the kail-brose of Auld Scotland."

If we are to have improved cookery then, whether the pudding be English, Scotch, or French, it must be in the farm-kitchen or cottage where the improvement must be made, and not in the bothy. Why should not every Jenny cook Johnny's kail?"

The bothy controversy resolves itself into the question, Should our unmarried men learn to cook their own kail and keep houses? or should they be taxed to pay woman's hands for doing both? To us the practical solution is manifestly the former; but before entering upon its details let us first dispose of the other two heads of our subject, "household accommodation and self-tuition," as this will clear away much of the mystification that surrounds the bothy system.

It is now a settled question both in principle and practice that young men and women, boys and girls, be kept separate, and that they have private apartments individually for self-improvement. In all our large towns this is now exemplified, and there cannot be a doubt but the same principle is slowly working its way into our rural districts. Indeed, in not a few cases in Scotland, this is already a realised practice, every unmarried man having his bed-room to retire to, for self-improvement during the long winter evenings, and leisure hours generally. Sitting in the farm-kitchen or at the cottager's fire-side, and sleeping in some hay-loft over the horses, or even behind them, or in an adjoining stall, as we have seen beds both in Scotland and England, is out of date a long way. When members of a cottager's family grow up and enter service upon the farm with their father, they may remain at home at bed and board if there is a sufficiency of room for them. We have had a father, two sons, and two daughters thus provided for; but we have no hesitation in saying, that the two sons would have been better had they been from home, and taught by experience to provide for themselves. The sons of ploughmen can only receive a very limited education from their parents. Amongst the better disposed and brought up there always has been a strong inclination to read books and periodicals, and otherwise acquire a higher standard of knowledge, so as to be able and qualified, should opportunity occur, of advancing themselves in the world, and this spirit should be encouraged amongst the more profligate of their number. Several of our old ploughmen, for example, now farm for themselves; others are bailiffs or fill similar situations; and we have often felt for these poor fellows when obliged to leave the kitchen and the bothy, and read books, &c., behind their teams in the stable because we had no private furnished apartments to give them in which to improve themselves. And what merits a passing notice is the fact that they complained more when in the kitchen than they did after a bothy was erected for them, and we believe their complaints were well founded. The reason of this difference in favour of the bothy will be found in the next paragraph.

Similar provision is required by unmarried women-servants. Private sleeping apartments to which they can retire for self-

improvement is as necessary on their part as on that of the men. But there is one difference which calls for special consideration, as upon it the knotty question of bothies for women hinges. It is this: women are required in the kitchen. Men are not; and it is very evident, from the last paragraph, that before we take back the men and boys to the kitchen fireside during the long winter evenings of the North we must first turn out the women and girls. Neither landagent (factor) nor parson has ever ventured to tell us the contrary. All who have turned out the former to a bothy must have felt the relief in the kitchen, and none more so than decent, honest, industrious women-servants. Now, we have in these simple facts a practical exposition of some very important principles. In the first place, for instance, as we cannot do without women in the kitchen, it is evident that, *if we wish to cultivate decency, honesty, and industry there*, we must not take back from the bothy the men-servants. In the second place, if we wish to cultivate exemplary cottagers' wives, ought we not to give all the unmarried young women we employ upon our farms turn-about weekly in the kitchen, so as to give them the necessary practical instruction, besides encouraging self-improvement in their private apartments when they return from working outdoors? If we wish to cultivate the social, moral, and religious welfare of this important section of the rural community, now being much neglected, ought we not to find regular work all the year over for as many female hands as we can profitably employ, and thus train them in the kitchen and private rooms? It will, no doubt, be said by some that if a farmer gets a good servant it would be more profitable for him to keep her there, and let the outdoor servant-women shift for themselves amongst the cottagers, as they do in England. We believe this has long been the practice of the South, generally speaking; and we regret to think that it is fast becoming that of the North also. But is it not a very short-sighted, selfish way of solving so comprehensive a problem? Is it not increasing our poor-rates, lowering the standard of health and strength, and otherwise saddling us with troubles tenfold worse than a little bother in the training-school of the farm kitchen and field? No doubt domestic life is a woman's natural calling; and that no reliance can be placed upon her permanent services otherwise. By all means get her well settled in her own house as soon as possible; but before you can rear strong, robust, healthy women for cottager's wives, you must give them plenty of open air exercise in the field so long as they are unmarried. The young woman ought to be taught the physiological rationale of this. In some English counties the men deprive the women of half their health, giving employment before marriage; and when they give them a house of their own they then feed them and their children on "short-commons!" No doubt, when the English practice first began, women could make more at lace-making, straw-plaiting, and other manufactures of this kind than what they could do at farm work, so that the English farmers had no alternative but to do the light work of the farm as well as the heavy with men and boys; but the race of steam and machinery has reduced the earnings women now make at such work to a mere pittance, so that before they can support themselves, the long hours and confinement are killing on their constitution. To young women thus confined, a week's work out-doors in the open air is a health-giving God-send, and as such thankfully received by them.

We are now in a position to take up the bothy controversy, and dispose of it according to established data or precedents, both in Scotland and England. In all the upper ranks of society the majority of the unmarried men and women prefer, for example, living in furnished apartments, and why should not the same principle be reduced to practice in our rural districts amongst our labouring classes? The practice is not more common amongst ourselves than it is in the British capital and every other place in England, so that our readers generally must be familiar with it. A young gentleman rents a room or suite of rooms, at so much weekly from somebody who has a larger house than they require, or of some house-keeper who makes room-letting her special calling. In such cases the landlady may cook and clean the rooms, &c., &c.; or, if the tenant is a poor man, he may kindle his own fire, clean his own shoes, and cook for himself, the landlady only making his bed and cleaning out his room; and if the tenant is of the other sex she may make her own bed, as well as cook, &c. Moreover, if rooms are rented for three, six, or twelve months, the

terms are easier to the tenants. Again, in the case of our most improved houses, or furnished apartments for single men, the farmer gives each man a furnished bed-room, with a stated allowance of firing, oatmeal, milk, and potatoes, a meal-chest, and the use of a common kitchen or cooking apartment, and apparatus in which each man cooks for himself. The man kindle the fire and cook, but the farmer engages some woman to do up the bedrooms daily. Now, in all this the reader can hardly fail to perceive certain well-defined principles slowly working their way into general practice. Of the importance of the movement no one can doubt, who has any practical experience in the matter; and, therefore, nothing can be more imprudent than to throw opposition in the way of further progress in the same direction.

Two questions have yet to be briefly disposed of. Why does controversy exist? and how to stimulate further improvement.

On the cottage-bothy and kitchen controversy there is evidently no lack of misunderstanding, especially in the former two topics. Few who have bothies now advocate a return to the kitchen system, although many who still have their men in the kitchen do what they can to justify the practice. We must here, however, observe that many kitchens are virtually bothies, and many bothies a sort of hybrid, or old-fashioned scullery to the kitchen. All such hybrids are fast getting out of date, and not before it is high time.

As to the cottage system, some of its warmest advocates appear to overlook the fact that for every married man there is, and must be, at least, one unmarried, besides one or two youth in service. The question is evidently, it will thus be seen, one of proportion and distribution, for as we have rather a redundancy of married hands, and as they have cottages somewhere, it consequently follows—and such is the fact—that they are both badly situated and distributed, while they are out of date as to the accommodation they afford. When one farmer says he prefers married men, and another that he prefers unmarried, the facts of the case prove that the minds of both are prejudiced in favour of what can never become general. Were married and unmarried equally distributed, and were there, say four cottages on the farm, there would be from eight to twelve unmarried men and boys to provide for, either at the homestead or farm cottages. But the latter system is out of date, and even more objectionable than the kitchen, for, if the cottager's family is young, the two parents and their little ones are plenty at the cottage fireside; so that to wedge in two strangers here and four there is a gross violation of the so-called "divinity of the patriarchal system" itself. And, if the cottager has grown-up daughters the case is tenfold worse. In short, this wedging-in system is neither patriarchal nor divine, for it will not bear investigation, either at the bar of principle or practice, whether seen from a physical, moral, or religious point of view. And, besides, our cottages afford no such accommodation as our unmarried men now require; and to call upon our landlord to build such, we should be liable to the just rebuke of taxing his pocket something extra, as the next paragraph will show, in order to relieve ourselves of no better professional responsibility.

Agriculture is an art, and boys when they enter service are for several years apprentices. In principle, therefore, the majority of unmarried servants are apprentices. Very solemn responsibilities thus devolve upon masters, and nothing could be more at variance with moral and religious principles than for a farmer to remove this responsibility from off his own shoulders and to place it upon those of his cottagers, who are, by their inferior education and position, less able to bear it. Again, the homestead is evidently the best site for the residence of the unmarried man, being the cheapest and most economical to all parties. Thus the landlord can build more commodious apartments for less money at the homestead than at the cottages, while the men are nearer their work, and more immediately under the eye of the master. And again: the principle of association is now nominally acknowledged to be favourable to the development of both mental and physical talent. Thus, in the upper ranks of life we have our colleges, clubs, &c. Parents find that both boys and girls do better when separated and placed under others accustomed to teach and control youth than under themselves, and the case of the agricultural labourer is no exception to this well-established rule. Indeed, at present no class, generally speaking, has so

much reason to be thankful when their boys enter service and thus leave their parents' roof, provided they get good masters, than farm labourers, for the low state of morality in bothies is mainly due to the low state of religion in cottages. From this conclusion we are glad to say, there are now many more exceptions than there were a few years ago; but it must still be confessed, that cottages are yet a fruitful source of wicked boys and young men, who make themselves a nuisance in the field and a curse both in bothies and dormitories, when the better-disposed have not private apartments to which they can retire for self-improvement and rest. These three principles demand matured consideration.

Under the last head, *progress*, we can only throw out a few queries—Better cottages, more conveniently situated, and more under the eye of masters, are greatly wanted for married men, alike for professional, moral, and religious improvement. The household accommodation of unmarried men is still

further behind the age in which we live. Bothies and the dormitories that belong to them are a disgrace to landowners. In many cases they are the rudest make-shifts imaginable—lower in architectural style than the wigwam of a red Indian, while the domestic etiquette of the men is even manifold rougher and less polished. For breeding, an Irishman's pig would put to shame the inmates of many a Scotch bothy! As to cookery, the diet, the gipsy-pot, with its iron-ladle, and the whole cooking utensils, are out of date; new houses, having the necessary means and apparatus for enabling the men to improve their distary, are very much wanted. Ought not such houses to have gardens? and ought not the men to make their beds and do the whole work in such establishments? and also furnish the linen, &c.? What is to hinder them? In all similar establishments men do such work, and unmarried Scotch ploughmen ought to be ashamed to remain the exception.

MAN-O'-THE-MEARS.

THE DAY OF REST.

TO THE EDITOR OF THE MARK-LANE EXPRESS.

SIR,—Will you allow me to advert to the subject of a recent leading article you published (together with an extract from a contemporary of the press), on the "Leigh case," as affecting the question of Sabbath observance, from some particulars of which I cannot but differ, viewing the Sabbath as one of the greatest of Divine gifts to our fallen humanity, and a grand demonstrative testimony to the truth of Christianity, any invasion upon the inviolability of which cannot, consequently, be too jealously guarded against.

I neither desire to uphold the decision of the Leigh magistrates, nor to condemn the Sunday haymakers, in regard to whose individual act, the occasion, for aught I know, may have furnished a justification, which, if satisfied conscientiously of, they must naturally enough consider themselves very hardly dealt with. While I would join in the tone of your article of the 14th instant in deprecating the assumed Sabbath sanctity of the north, in as far as facts show it to be in appearance only, and not in deed; I feel on the other hand, as true patriots to our country's best interests, we cannot be too jealous of admitting any arguments on the subject, capable of being construed into an apology of continental laxity, which might have the effect of introducing permissory customs here that would speedily degenerate into an importation of similar neglect and outrage of the just observance of the day amongst ourselves.

That works of necessity and mercy in varied departments of human action are incidental to the physical necessities alike of man and beast, rather than being pleaded in extenuation of anything trenching beyond the limits of this category, should excite the greater care to exclude all incidents of ordinary employment not required by the current exigencies of the day.

Especially is this circumspection called for on the part of the farmer, whose business peculiarly necessitates some work being performed on the Sabbath, the actual extent of which depends much upon judicious management or the contrary in Saturday preparation.

No one would attempt to contend that the shepherd and herdsman can on the seventh day ignore the scriptural admonition as not then binding upon them: "Be thou diligent to know the state of thy flocks, and look well to thy herds." The team-man, or carter, likewise has ancient and the highest authority for leading the ox and the ass away to watering on that day.

That seed-time may in due season be succeeded by harvest, the precious seed deposited in the ground must on

Sunday as at other times be secured from becoming food for the birds of the air, and so failing of its intended end—to afford future sustenance for man and beast. But to admit the propriety of proceeding beyond these necessary acts to the securing of crops, must be very questionable to all those who feel a high regard for the Sabbath.

Such a course must involve a seventh day continuance of labour both for the horses and a great portion of the labourers, of whom only a few isolated individuals are requisite for the works of necessity in feeding the stock, &c.

Moreover, seeing the farmer in the very nature of his business depends for success, first and last, upon the arrangements of Providence in regard to the weather, a condition on which, so to speak, he accepts his avocation by using the Sabbath for the ordinary operations of the farm, on account of imagined personal exigency, he implies a distrust of that Providence upon whose provisions alone the success of all his labours depends—who has both said, "Remember the Sabbath day to keep it holy," and given the encouraging promise, "Those that honour me I will honour." Surely, a temporary disappointment in the delay or withholding of anticipated fine weather, should not break down the farmer's general faith that the seasons shall keep their appointed rotation while the world standeth. But once admit any general latitude in this direction for individual judgment to exercise itself upon, and the labourer, sufficiently already the drudge of the soil, would soon lose his property in the seventh day cessation of toil secured him by heaven in mitigation of the hardships of his lot. He would thus become dependent alone on the caprice of a master, who, if only consulting self-interest, apart from moral obligation, might speedily find increasing instances when the uninterrupted pursuit of labour would appear preferable to the suspension of it.

The same principle that would admit the justifiable use of a fine Sunday for ingathering the crops, might soon be extended to appropriating the same period in a wet season for working the drill.

To extricate an ox or ass accidentally fallen into a pit on the Sabbath, for which act you justly quote Divine authority, as being necessitated by that which was unforeseen, cannot come under the same category as following the regular operations of the field in getting in a crop for the sake of saving fine weather. This I have seen done on a Sunday in far from exceptionally wet seasons; and if it became generally a matter dependent on the individual conscience of the farmer, as I have said, the security of

the English farm labourer in the enjoyment of the Sabbath's rest would soon be done away with. Legalizing a desecration of the Sabbath in any department affecting its outward observance should ever be viewed by every true-hearted Englishman as inimical to the nation's weal, and as calculated to produce a long train of consequent evils.

Wherein is our country more proudly distinguished among the nations of Europe than in her comparative tenacious conservation of the Seventh-day's rest? the physical and moral politic policy of which has not in the past wanted able defenders, and it is to be hoped never will, as standing associated with the best interests of our national welfare.

To broadly propound such a sentiment as that you give publicity to from a contemporary, that the saving of a crop of hay or a burning house on the Sabbath are equally works of necessity, involves a principle, which, if established and generally acted upon, inasmuch as all seasons but the most exceptional are marked by fickle weather at some stage, would result henceforward in fine Sundays,

during haysall and harvest, being used for securing crops then in order for housing or stacking.

We do not find in the Divine institution of the Sabbath an exception to the obligation of observing it any season of the year. It is either equally binding at all times or not binding at all, and to those who can accept the latter alternative it would require only the legalizing influence of general custom to use the Sunday for ordinary labour whenever personal expediency prompted such a course.

While, again, your contemporary advocates that the Leigh case stands connected with an active bigotry that threatens the poor man's Sunday, I must on the contrary maintain that nothing can more threaten the poor man's holiday (in either sense of the word) than legalizing labour, and thereby flattering the conscience of masters to justify themselves enforcing it upon that day.

I am, sir, yours, &c.,

A SUBSCRIBER.

P.S. I should have addressed these remarks to you at the time your article appeared, but for then being unavoidably prevented.

ARTIFICIAL SWARMING OF BEES.

I propose to give for the benefit of your bee-keeping readers an outline of a system practised by me, whereby swarming is accomplished artificially, and the stock multiplied with the same certainty, and by a method similar to that adopted by the farmer in multiplying flocks and herds. What I shall give will be found demonstrably true and entirely practicable, even to those who use the common box-hive, so that I think no one need suspect me of having an "axe to grind" at any rate.

When the drones appear in the spring, and the hive is full of comb and bees, is the time to swarm them by this process. It should never be attempted after a swarm has issued in the natural way, nor should a second one be obtained in less than twenty-five days after the first.

In the middle of a pleasant day, when the bees are abroad, go to the hive, and blow into it at the bottom a few whiffs of smoke from a pipe of tobacco or a roll of cotton rag. Let enough smoke go into the hive to arouse the bees and set them to seizing on the honey—which will be known by a long buzzing within the hive—but not enough to stupefy them. Let the hive stand five minutes, until you blow a little smoke into all the hives within four or five rods; now gently raise one edge of the hive, and blow in a little more, and immediately remove them three or four rods, carefully setting them down under a shade, if it is at hand, bottom up. By this time the bees will have become filled with honey, and will not sting unless you pinch them, or they are otherwise provoked. Place an empty hive or box over this hive, mouth to mouth; tack together with a couple of nails, and cork all crevices with rags. Now drum or rap on the sides of the bottom hive for about ten minutes; draw the nails, lay a sheet on the ground, and very carefully remove the top box, setting it down upon the sheet. Remove the old hive a few feet away, covering the mouth with a cloth.

Now, having another empty box, turn it down on the sheet with one edge up, after the manner of hiving a swarm of bees; then, with a ladle or large spoon, slowly dip the bees from the box that contains them, and pour them down in front of the empty hive. If the weather is very hot, sprinkle slightly with water to prevent the queen from taking wing, and they will run in. Should there be several swarms where the old ones stood, and close to it, it would be well to cover them with a sheet while this is being done, to prevent the queen from entering them, should she chance to fly.

As the bees are running into the empty box, look out for the queen. She will be readily seen, as she is at this season

nearly as large as a drone, and much longer than a worker-bee. Should she not be found, immediately reverse the bees, and try until found, for she is among the bees sure, as she is among the first to leave the old hive upon inverting it.

When found, secure her as follows:—Cut a piece of wire cloth, say twelve meshes to the inch, two by three inches; roll it round the finger in the form of a cylinder, pinch close one end, and, putting the queen into it, close the other end with a cork. She can be safely taken by the wings in your fingers, for she will not sting, however roughly she is handled. Now place your old hive on a new stand, at least four rods from where it stood before, and put the bees into it, except about one pint; these put into a new hive on the old stand, having a hole in the top one and a-half or two inches in diameter, through which the queen cage is suspended by means of a wire two or three inches long, with a block over it to keep out the light.

The sheets are now removed from the other hives, and you will find daily additions to the new hive from the old one, as it occupies the old familiar spot, while the old one will retain the young brood, of which great numbers will be hatched daily. The third day, about an hour before sun-down, blow a whiff into the top of the new hive; draw up the cage, and release the queen; put her by the entrance, and she will go in at once. Considerable comb will have been already built, and by morning the breeding cells will be well stocked with eggs. Thus you will have swarmed your bees certainly, and without watching them, or of running the risk of their leaving for the woods.

By one who has performed this operation a few times, the queen bee may be found in three minutes, by simply turning up the hive, and blowing the smoke into one side, looking for her among the bees running up and over the opposite side, accomplishing the feat of artificially swarming a hive from the old box in the time necessary to hive a natural swarm.

One word to those who practise artificial swarming by this method or any other. Queen cells can be procured by simply caging the queen as above, without removing her from the hive. This expedites the business, and adds greatly in propagating Italian queens, since it obviates the necessity of removing her to a strange colony. Some will ask how a queen can be supplied to the old hive after putting its queen into a new hive? In answer, I will say the bees will do this by raising one from the worker brood already laid by the queen just removed.—*Michigan Farmer.*

EAST CUMBERLAND AGRICULTURAL SHOW.

Following close upon the heels of other local exhibitions of farming stock, came that of the East Cumberland Agricultural Society on Friday, Sept. 18, in a field adjoining the Warwick-road, Carlisle. Taken as a whole, looking at the various sections and comparing them with their predecessors of very recent date, judging of the large assembly that crowded round the chief points of attraction, we cannot help recording the meeting of 1863 as one that reflected great credit upon all who helped to promote it.

JUDGES.

Shorthorns and Sheep.—Mr. John Patterson, Holbeck; Mr. W. Borthwick, Whitehaven.

Galloways and Swine.—Mr. George Rome, Glenger Bank; Mr. John Steel, Lands, Ecclefechan.

Saddle and Harness Horses.—Mr. R. Hodgson, Bramfer; Mr. Thomas Sutton, Staindrop, Darlington.

Cart Horses.—Mr. Andrew Forster, Becklands; Mr. John Irving, Shap Abbey.

A W A R D S .

SHORTHORNS.

Bulls above two years old: First prize, Mr. Newton, Cholerton, £10; second, Thomas Gibson, Burnfoot, £3.

Bulls under two years old: First prize, Mrs. Steel, Cardew Hall £8; second, T. G. Wilson, Thistlewood, £1.

Shorthorn Cow or Heifer above three years old, in calf or milk: First prize, Richard Wilson, Ellonby, £4; second, John Atkinson, Bywell Farm, £2.

Shorthorn Heifer under three years old, in calf or milk: First prize, John Atkinson, Bywell Farm, £3; second, Wm. Addison, Oulton House, £1.

Shorthorn Heifers under two years old: First prize, Mr. Atkinson, Bywell Farm, £2.

GALLOWAYS.

Bulls above two years old: First prize, John Ivanson, High Knells, £10; second, John Goodfellow, Beyont-the-Moss, £3.

Bulls under two years old: First prize, J. T. Mounsey, Craigburn, £4; second John Ivanson, High Knells, £1.

Galloway Cows or Heifers above three years old, in calf or milk: First prize, James Graham, Micklecullock, £4; second, R. and J. Little, Guards Mill, £4.

Galloway Heifers under three years old, in calf or milk: First prize, Thomas Chambers, Pelutho, £3; second, John Johnston, Pedder Hill, £1.

Galloway Heifers under two years old: First prize, John Johnston, Pedder Hill, £2.

SWINE.

Bears under four years old: First prize, John Brown, Kirkbampton, £2; second, R. H. Watson, Bolton Park, £1.

Sows under four years old, to be in pig or milk: First prize, Arthur Wannop, Geltaide, £2.

SHEEP.

First Shear Leicester Tup: First and second, Robert Jefferson, Preston Haws, £2 and £1.

Second Shear Leicester Tup: First prize, Robert Jefferson, Preston Haws, £2; second, Joseph Bell, Scalehill, £1.

Third Shear Leicester Tup: First prize, Robert Jefferson, Preston Haws, £2; second, Marshall Stephenson, Fourstones, £1.

Best Pen of Three Leicester Ewes, must have reared lambs this season: First prize, Jos. Bell, Scalehill, £2.

Best Pen of Three Leicester Gimmers: First prize, Robert Jefferson, Preston Haws, £2.

HORSES.

Brood Coaching Mare, with foal at foot: First prize, Sir F. U. Graham, Netherby, £3.

Brood Cart Mare, with foal at foot: First prize, William Moffat, Newtown, £3.

Brood Coaching Mare, in Foal: First prize, John Brown, Wiggonby, £3.

Brood Cart Mare, in Foal: First prize, Henry Bailton, Snittlegarth, £3.

One year old Harness Colt: First prize, J. H. Webster, Watchtree, £1.

One year old Saddle Colt: First prize, R. Norman and Son, Oughterside, £1.

One year old Saddle or Harness Filly: First prize, John Birkett, Broomhills, £1.

One year old Cart Colt: First prize, Richard Graham, Beckhouse, £1.

One year old Cart Filly: First prize, John Hind, Seaville, Cote, £1.

Two year old Harness Colt: First prize, Christopher Wannop, Wallhead, £2.

Two years old Saddle Colt: First prize, Wm. Hetherington, Carlisle, £2.

Two years old Saddle or Harness Filly: First prize, Thos. Gibson, Grinadale, £2.

Two years old Cart Colt: First prize, Thomas Wannop, Brunstock, £2.

Two years old Cart Filly: First prize, George H. Head, Rickerby, £2.

Three years old Harness Colt: First prize, John Porter Holmefoot, £2.

Three years old Saddle Colt: First prize, George Waugh, Scaugh, £2.

Three years old Saddle or Harness Filly: First prize, Joseph Tyson, Moorhouse, £2.

Three years old Cart Colt: First prize, Thomas Gibbons, Burnfoot, £2.

Three years old Cart Filly: First prize, George H. Head, Rickerby, £2.

A Silver Cup, added to a Sweepstakes of 10s. each, for the best Hackney of any age: H. J. Percy, Langrigg.

Bronze Group, value £4 10s. each, for the best four years old Saddle or Harness Colt Filly: Sir F. U. Graham, Netherby.

PONY PRIZE.

A Silver Medal, added to a Sweepstakes of 10s. each, for the best Pony of any age: Wm. A. Fidler, Wigton.

A Silver Cup, for the best Pair of Horses for Agricultural purposes: Thos. Gibbons, Burnfoot.

SIMPLE RULES ON SHOEING.—1st: After having taken off the old shoe, shorten the toe, and remove all the dead and loose parts of the hoof. Do not cut the sole or pare the frog, except when the foot has received an injury from a nail or otherwise, when it must be well cut out. —2nd: Let the shoe be of equal thickness, or rather thinner at the heel. The ground and foot surface should be perfectly level. The shoe should lie light on the heels. Too many nails are objectionable, and these should be kept as far as possible from the heels. —3rd: For the hind feet there is no objection to calkins, though they are of doubtful benefit. Horses travel better without them. The hind shoes are made thicker at the toes than at the quarters; the nails also can be put closer to the heels without causing inconvenience. —4th: Side clips should be avoided: they destroy the hoof. The same is the case when the nails are too close together. The feet should never be rasped, as it destroys the enamel of the hoofs, renders them brittle, and causes sandcracks, and consequently lameness. —5th: Expansion is a fatal error, which has led to many abuses in shoeing, such as paring of the sole and frog, rasping of the hoof, &c. The elasticity of the foot, which is, however, very limited, exists only on the upper part of the hoof, principally round the coronet. On the lower part, and the toe it is nil.—W. ERNES, M.R.C.V.S. London, in *Veterinarian*.

SALE OF THE BRANCHES PARK HERD.

Those Britons who love the Ring-side, have, as Mr. Gladstone would observe, "one of three courses to pursue." They can back their fancy, and undergo some 8m. 20s. of St. Leger agony on Doncaster Moor; they can run the risk of being bonneted and robbed by "The Fancy," in the grey dawn of a Tuesday, at the Great Western Station; or, if they venerate the shorthorn, they can mount the waggons with Wetherell or Trafford, as "Mr. Speaker," and hold a pleasant parliament of their own. The present year has been unusually productive of such gatherings in Cambridgeshire, and Branches has just beaten Babraham in its average, which is £57 8s. 10d. for 79, against £55 14s. for 82, and £54 17s. for 63. The spirit which "Lady Pigot's lot" has infused into Royal and country shows, her Royal victories, first with Second Duchess of Gloucester and Empress of Hindostan, and then with "The Pride" and the wondrous Rosedale, and her daring and too often unfortunate purchases, have been duly noised abroad, and formed the staple talk of many a market table for these four years past. Hence it can hardly be wondered that people were led to invest the dispersion of her herd with the idea of "a sensation sale," and determined, even if they did not buy, to take a run down to Newmarket, and see what they called "the fun." Branches Park was equal to the occasion, and the largest company and the best average of the year were the upshot. It lies about seven miles from Newmarket, and true to the traditions of the place, the very first objects which catch your eye, as you enter the front hall, are the heads of the departed Stanley Rose and Queen of Athelstane. "Nestor" was sitting calmly under this last memento of his old favourite, as we gave him our first greeting; but Mr. Douglas would have shrunk from the sight of The Queen, as the complaint of which she died had made her nose as black as a Poll Angus.

Lord Feversham in his chaise-and-four was one of the earliest morning arrivals; but the London division (to whom a special train was allotted at night) had rather a sharp run to be there for the luncheon, and those who specially meant business rested over-night at Cambridge or Newmarket. After the inspection, there seemed a pretty general opinion that the average would not be higher than 55 gs. Princess Edward, Empress of Hindostan, Pride of Southwicke, and Rosedale, were "doubtful"; many of the females were voted very middling indeed, and the majority of the bulls (of which eleven were white) lacked shoulders, and passed muster very badly in the house, although they looked well enough in the "charmed circle." There were, nevertheless, "plenty of plums in the bowl," with good men and true to bid for them, and after a survey of Mr. Booth's Ravenspur, by Sir Samuel, from Red Rose, the four hundred sat down to a very beautiful luncheon, which was set off by a long line of prize cups, with the Durham County Challenge Cup as their imposing centre.

The tent was pitched in a very picturesque spot, among the oaks and elms in the park, about two bow-shots from the ring, whose rails (the same which had twice done duty at Babraham) were entwined with ivy, box, and laurel. When luncheon was nearly over, her ladyship left her phaeton and brown ponies, and was led in by Sir Robert, amid great cheering, to the noble chairman the Duke of Montrose's table. His grace then rose, and after giving the health of the Queen, proposed that of Sir Robert and Lady Pigot, and spoke of the pleasure he felt in believing

that a Shorthorn career which had been so successful hitherto in the show-yard was not to end with that sale. Sir Robert, in returning thanks, expressed his thankfulness that his grace had not separated husband and wife, but made it certain that her ladyship would lend him her aid in a reply, and trusted that they might in future, as hitherto, keep up the fame of the Booth blood at Branches. Her ladyship then spoke as follows: "In the presence of the distinguished breeders of Skyrocket and Royal Butterfly, the representatives of Warlaby and Killerby, and my excellent Shorthorn tutor, Mr. Torr, I feel almost ashamed to hear the sound of my own voice. However, I must try and use it to thank you for your great kindness in coming here to-day, and I hope you will give me an excellent average. Now remember, I have won 217 prizes—no, I am wrong—268 prizes; and I intend to come out again with a new herd, and beat the best of you, meet where we may (great cheering and laughter). Permit me once more to thank you from my heart for your kindness, and to propose the health of my good old friend Mr. Wetherell, and the glorious interests of the 'Red, White, and Roan.'" Upon this, Mr. Torr sprang on to a form, and after remarking that he had never had a pupil half so quick as her ladyship, and trusting that the good feeling and spirit outside the tent would correspond to what had been shown inside, proposed the noble chairman's health. With his grace's response, and a few minutes' pause while a tremendous shower passed over, this sparkling prelude was brought to a close, and the waggons were soon filled. Sir Robert and her ladyship, with the Duke of Montrose, Lord Feversham, Colonel Towneley, Colonel Leslie, M.P., Mr. and Mrs. Benyon, Captain and Mrs. Gunter, Mr. T. Drake, Mr. Torr, Mr. Thomas Booth, Mr. C. P. Gell, and a few others occupied the pavilion overlooking the ring, or rather "the upper chamber," which was as conspicuous for its dashing speculation as "the lower," throughout the whole of the afternoon.

It was in truth a grand assembly of its kind, and through sunshine and shower its enthusiasm never flagged. Gloucestershire was well represented in Mr. Wetherell's wagon by Styles Rich of Didmarton, who was said to be looking after Second Duchess of Gloucester, and Sowerby the agent for Mr. Apperley. John Booth was there with a generally "watching brief," and Mark Stewart and Jamie Douglas had a keen eye to the fortunes of "The Pride," and the Spicey and Rose of Autumn tribes. Near them were Ladds of Ellington, Beauford, who was entered as a Royal "colt" this year, and Bland of Coleby, watching his old friends of the Yorkshire ring; Christie of Chelmsford, and the Chairman of the Islington Hall, who seemed especially in his place as Clerk of the Council, when the massive Empress of Hindostan, Victoria 35th, and Rosedale loomed in sight through the wicket. There, too, were Atkinson with eyes for nothing but Magnolia, Wood of Castle Grove and Bustle tribe fame, and, side by side with Woods from Norfolk, whom Southdown men know well, was Trafford, with four or five commissions from the owner of the Royal "Essex calf" in his pocket. Atherton, like Barclay of Keovil, looked on and went in for nothing, but his wagon was always catching Mr. Wetherell's eye, as Payne, keen as a hawk on behalf of the Duke of Buccleuch, and Waldo, alike energetic for himself, cut out plenty of work for those who were against them. Then, as we looked farther on, there were Patmore of Bishop Stortford, Henry Webb of Steety Hall, J. C.

Adkins of Charmer fame, Garne and his friend Savidge from Oxfordshire, who had come for a white bull after the breaking off of a negotiation about The Hero, and was bent on taking back one of the Lamp of Lothian tribe. Near them were the reverend owner of the Hellidon herd, and Captain Oliver selecting two or three for Lady Chesterfield, Sheldon from Shipston-on-Stour, the Brothers Falkner from "Rothersthorpe and its reds," Gell of York, Crawley, and Sharpe of "Burleigh House by Stamford Town." There, too, we espied John Burgess of Edinham, the owner of General Murat, Wortley of Ridlington, Tallant still of Bushey Grove, but looking out for a new sphere of action among the prize Shorthorns, James Dudding of Panton, thinking no doubt of that grand steady average of 100 at 50, Torr, who was of course "in places three at once", and Culshaw, "bearded as the pard", who peeped in fitfully and mysteriously at corners, and then became a dissolving view for a space, till we never just knew where we had him. Aylmer and Gambell came together, as usual, from Norfolk, and Williams all the way from Truro. Gebhardt, too, who bid and bought so lustily at Babraham, was there, but not just 'i' the vein; and though last not least, Chirnside, the great Australian buyer of the hour, who had but just spent nearly 5,200 guineas on blood stock at Sledmere and Doncaster, and yet got something in his pouch to spare for Shorthorns.

The opening of the sale was rather peculiar, as the 20-guinea purchaser of Blossom could not be found, and she was put up over again, and made a guinea more. She was a lengthy cow; and her useful half-sister Rose of Braithwaite looked like a great milker. Carnation was thin through her shoulders, Sweet Primrose's loins were very poor (the fault of too many of the females), and Vesta was of a much neater stamp, and seemed cheap. Little Spicey, with her strong Exquisite head, bears her thirteen years bravely. The biddings from 30 to 40 went by single guineas, as fast as Mr. Wetherell could count them, and Mr. Waldo was most industrious. "Fifty" was Mr. Torr's, who had a try for her at the Killerby sale six years ago, but Mr. Waldo was the winner at 56, and intends to put her to his pure Booth bull Duke of Leinster. The first half-dozen averaged 31 gs., and then we got to Rosey. This "dam of the crack of three Empires," as Mr. Wetherell rather poetically put it, looks and wears well, and is a neat one altogether, except perhaps about her rump-end. She went very quickly from 30 to 60, and at 96 the Rev. Mr. Storer's nod settled her destiny. The sight of the shoulders of her last calf, Comte de Vermandois, did the light roan La Vallière no credit, or the remembrance of her Prince Talleyrand and her other good sons would have sent her far beyond 90, albeit she was rather low in condition. The Pavilion was very "hot" upon her, and the Duke of Montrose and Mr. Torr, sitting almost side by side, seemed to fight it out between them, Scotland winning the bout. Lady Sarah, a lengthy, wide, short-legged Baron Warlabycow, and a capital 85-guinea purchase of Sir Robert's at Mr. Ambler's sale in '57, fell to the nod of Mr. Lovell, who was said to be purchasing for a young Northamptonshire breeder; and then it was announced that Second Duchess of Gloster had been withdrawn in consequence of illness. This was no small disappointment, as one gentleman, who has "some of the sort," had come from a considerable distance to bid for her. Her old chum, Empress of Hindostan, was ushered in next. She looks far handsomer than she did at Poissy, bears feeding well, and looks very like a gold medallist some day at Bingley Hall and Ialington. We were glad to get forward to Cherry Rose, which seemed the "very good milker," she was described to be, and will help to fill the Bretby cream bowls. "Bonny Billy" was very plain, and Lady of Bonhill, a short-legged cow, rather of the present Queen of Athelstane stamp, but not so aristocratic, went to keep company with the Empress. Her daughter, with her big knee and slack loins, made about half the price; and then, just as we reached Rose of Promise a 270-guinea purchase at Southwicke in '60, but not just right in her loins, or a prize cow, the thunder rolled, and the rain came down in

good earnest. Nobody heeded it. 100, 105, &c., 150. "That won't do," said Mr. Wetherell, "I want a back-load of money for her;" and away they went; Mr. Chandos Pole Gell, who bid from the Pavilion, taking her, as he did her daughter Rose of Hope afterwards. Roxana was a nice substantial cow, with, however, quite enough bone, and not especially cheap; and her staring colour was against a long, useful, and rather big-hipped Beggar Girl. Twenty lots were now sold, and the average was 53½ gs.

Pride of Southwicke has been very capricious this season, but still she is such a famous and handsome cow that Mr. Wetherell had only to "sit, and let you go: you can do all this without me"—from 60 to 100 without a check. Then they got to slow hunting, and Lord Feversham held steadily on the line, and his 120 settled the matter. Very beautiful she will look in Duncombe Park, like Symphony and Claribell before her. She turned to a Wetherby bull in the spring, but is now believed to be safe in calf to Ravenspur. The thick-fleshed Victoria 35th went cheap to Mr. Gilbert, but she "comes from a rare tribe in Robert Holmes's day;" and so thought Col. Leslie when he would not be denied for Victoria 38th. Sarah was a neat wholesome cow, with rather big hips, and Lord Walsingham's agent, Mr. Woods, was the last bidder but one; and Symmetry, a deep good ribbed cow, we believe from the Hellidon herd, went perhaps below her value. Lady Blanche was a nice cow, and so was Frances with her rare milk tokens; but although Mr. Wetherell spoke in very high terms of Abigail, it must have been her Booth breeding and not her back he alluded to, as she was all down-hill. Almack's Belle had a capital middle, but was only small, and after 100 the biddings slackened amazingly. With her we struck the average for 30, and it was still 53½ gs.

Queen of the Georgians was a gay-looking blood-like heifer, and it was then we first recognized the now well-known face of Mr. Chirnside, though not with a Wetherby stud-book and red slipper this time. The Duke of Montrose was an opponent, but the Australian fought in a calm imperturbable style, and would brook no defeat. Having made what seems like one good bargain, he bought "two at once" immediately after, as Castanet (whose grand dam Norma died recently at her owner's, Mr. Wood, of Castle Grove, leaving a fine bull calf the result of the Cesarean operation) was just due to Ravenspur. She has a true Shorthorn head; and although she would not be handy among the roses, there is something about her which has always taken our fancy since we saw her first as a heifer at Captain Spencer's. The Duke of Montrose and Mr. Chirnside had another match over her, and the latter and some one else were both in at 150, but the Australian cut the knot by an instant response to "Come along! who says 155?" and at that price, the same that she cost three years since, she was sentenced to the Antipodes. Mr. Wetherell might well tell her buyer that that he was "delighted to make his acquaintance in the old country." "Another plum and every cross Booth" was then his recommendation of that fine and true Shorthorn, Magnolia; but the bidding was not very terrific, and an 83 nod from Atkinson of "Peepy up the Tyne," as Mr. Wetherell said in reply to inquirers, settled her. Windsor Rosebud was rather a nice level cow; but a steery head detracted very much from Modred, for whom Mr. John Booth bid thirty. For the dark roan Princess Edward, who recently won in a pair with Rosedale at Ulverston, Sparkenhoe, and Leicester, there was very little competition; and then John Ward led his pet Rosedale into the ring. Wonder as she is in point of maturity, she loses some points by her rather vulgar colour, and lacks the contour of a Queen of the May; and it was seen at once from the service list that her Royal prize was gone. Some one put her in at 100, and then Mr. Stratford covered him like a shot with 105; at 180 Mr. Chirnside was in; Mr. Stratford would have no more of it after 200; and the Duke of Montrose and Mr. Chirnside had the finish to themselves. Again we cast up accounts, and the 40 averaged just 60gs.

Col. Leslie began at 40, and went steadily up to 80 for Empress of the East, and of Lily Maiden we can only say that she was bad behind the shoulders, and a moderate calf altogether. There was nothing more spirited in the whole

sale than the struggle for Castanira. "Get on; say something good to begin with," and straightway Mr. Torr's 50 was heard from the pavilion; then Mr. Strafford made steady running; the Duke of Montrose was in at 80, and Mr. Woods of Ireland said 91; but it was no use, as "the Herd Book" was not to be got rid of that way, and he got her very cheap at 180gs. The Duke of Montrose also bid for a lengthy good heifer, the Ladye Edburga, a little high on the tail, but Captain Oliver was still more resolute; and then after a little difficulty as to who bid 40, Alexandra was claimed by Mr. Payne, the bailiff to "The Bold Buccleuch." There was a smart fight over the neat level-made Victoria Lily, Mr. Torr going in for the honour of British Prince, and Mr. Taylor (who had only just arrived), for Sir Antony de Rothschild. "I'll give you 70," said the former; but he soon saw that it was Aylesby and Riby against all Lombard-street, and gave up the hopeless contest. Mr. Strafford then tried very hard to shake off Mr. C. P. Gell for Rose of Hope, a rare wealthy calf; but have her he would, to follow her dam; and this part of the entertainment shortly closed with a £39 10s. average for 59.

Viscount Windsor and Royal Prince were no very favourable specimens of the senior bulls, and although John Ward showed him off in his best fashion, Brian Borne's shoulders were sadly against him, and after making 82 he was sent out. A protest was allowed, and he was put up again, Mr. Waldo coming to the rescue with some sharp "Kentish fire," but "Butler of Badminton" fairly outlasted him, and the white son of Dr. MacHale departed with 40gs. more on his head this time. Hero of Bullegham was a gay bull with rather rough hooks. Duke Humphrey's shoulders were deficient. Pan might well have been "scratched for all his engagements;" his head has no character, one hind leg is twisted right in, and he is "blotchy on the tail head." Prince Erwald is "no where," but Prince Victor came to the rescue. He is a fine substantial bull, without being exactly a gallant one. He and two heifers, which are kept, make up the produce of the 500-guinea Victoria, so that there is not much loss there. Her ladyship refused 400 for the three as soon as the cow died, and she has not reckoned amiss. He was soon into the hundreds, and then began a grand duel between the Duke of Buccleuch's bailiff and Mr. Chirnside; the latter reaching 200 first. "Did you bid, Torr?" said Mr. Wetherell; but there came a negative from the Pavilion, and just at last Mr. Maxwell's agent dropped on to the contending pair, and as they refused to cover his 230, the bull crosses the Channel to his dam's old country. The struggle for British Hope (half-brother to Lamp of Lothian), and who has been very much amiss lately, was at first a very feeble one, and Mr. Savidge thought he had secured him very comfortably at 22 gs. An objection was raised, and he was brought back, and then Mr. Waldo and Mr. Savidge were pitted against each other, and Saraden had to pay 30 gs. more for the very fashionable blood. Prince of Rosales, half-brother to Rosedale, was another of the good wealthy ones, but the bad coloured Meteor sold for 70 guineas higher on the strength of his dam Belle Etoile. Vindex, another good-fleshed one, caused some sharp exchanges between Mr. Payne and Mr. C. P. Gell; and the former would not be denied for Silverstink, who was "all round a good bull," and taking form and flesh together, perhaps the best there; in fact, a most worthy grandson of old Windsor, and with two or three Bates crosses in him. The Duke of Buccleuch's agent marked him for his own, and assured us that he would have gone on at least 20 guineas if he had been pushed. Herman had good hair, but was rather high on the rump; but none of the last five were remarkable, and, taking them as a whole, £50 9s. 1d. for the twenty was a capital average. Spicey's one-week-old bull calf (not in the catalogue) was then brought out, and the scene would have been worthy of Punch, as the little roan infant reared round and round the ring, and the grave heads of the Shorthorn world looked admiringly on. However, no one would advance upon her ladyship's 80-guinea reserve, and John Ward junior tenderly bore him back. The Branches Herd No. 1 was ended; and the talk on the way home was of the pleasant meeting, and of Mr. Strafford's formal announcement of a large Towneley sale in the spring. Subjoined is a list of the prices:

COWS AND HEIFERS.

(The figures refer to "Contest Herd Book.")

Blossom, roan, calved Nov., 1850; got by Silkie Laddie (10947), dam (Daisy) by Rouge (8012)—Mr. Lovell, 21 gs.
 Rose of Braithwaite (late Violet), roan, calved April, 1852; got by Silkie Laddie (10947), dam (Red Rose) by Painted Laddie (10943)—Mr. Bottom, 27 gs.
 Carnation, roan, calved April, 1854; got by Leo (18150), dam (Carnation) by Silkie Laddie (10947)—Mr. Boye, 20 gs.
 Sweet Primrose, roan, calved Feb., 1856; got by Sylvia King (13819), dam (Sweet Margery) by Silkie Laddie (10947)—Mr. Barton, 27 gs.
 Vesta, roan, calved March, 1854; got by Van (13934), dam by Young Buckingham (14303)—Mr. Boye, 35 gs.
 Spicey, red and white (bred by the late Mr. J. Booth), calved April, 1850; got by Exquisite (8048), dam (Prejudice) by Diamond (5918)—Mr. Waldo, 56 gs.
 Rosey, roan, calved May, 1853; got by Master Bellville (11795), dam (Red Rose) by Vanguard (10994)—Rev. M. Storer, 96 gs.
 La Vallière, roan, calved Oct., 1855; got by Gainford 8th (12918), dam (Farewell) by Royal Buck (10750)—Duke of Montrose, 90 gs.
 Lady Sarah, red, calved Oct., 1854; got by Baron Waraby (7813), dam (Lady Mary) by Leonardo (7137)—Mr. Lovell, 50 gs.
 Empress of Hindostan, roan, calved Sept., 1857; got by Duke of Kent (14440), dam (British Empress) by Prince George (18510)—Mr. T. Crisp, 50 gs.
 Pauline, red and white (bred by the late J. Booth), calved May, 1857; got by British Boy (11206), dam (Hilda) by Hopewell (10832)—Mr. J. Howe, 36 gs.
 Rosy, red, calved Nov., 1858; got by Sir Colin (15276), dam (Merry Lass) by Horton Boy (13050)—Mr. Sexton, 30 gs.
 Cherry Rose, roan, calved Nov., 1858; got by Sir Colin (15276), dam (Young Cherry) by Horton Boy (13050)—Captain Oliver, 31 gs.
 Bonne Fille, red and white, calved July 15, 1859; got by Sir Roger (16991), dam (Bolina) by May Duke (13320)—Marquis de Verdon, 60 gs.
 Lady Curzon, white, calved July 31, 1860; got by Fumville (17863), dam (Lady Coke) by Jethro Tall (11616)—Mr. Brigham, 35 gs.
 Lady of Bonhill, red, calved Jan., 1858; got by Falslad (14530), dam (Norma 2nd) by Hobby Noble (11581)—Mr. T. Crisp, 68 gs.
 Moss Rose of Bonhill, red, calved May 24, 1860; got by Booth (14180), dam (Norma 2nd) by Hobby Noble (11581)—Mr. Sexton, 52 gs.
 Rose of Promise, rich roan, calved Aug., 1858; got by Heir-at-Law (13005), dam (Rose of Autumn) by Sir Henry (10824)—Mr. C. P. Gell, 200 gs.
 Roxana, rich roan (bred at Branches Park), calved March 23, 1859; got by Lord of the Valley (14837), dam (Roxana) by Hamlet (8126)—Marquis of Verdon, 70 gs.
 Beggar Girl, red and white, calved April 18, 1859; got by Sir Roger (16991), dam (Barrington Lass) by Sir Walter 2nd (10834)—Mr. Williams, 39 gs.
 Pride of Southwicks, roan, calved Jan. 1859; got by Mr. Turk (14872), dam (Vanity) by Heir-at-Law (13005), gr. d. Hoddam by Baron of Ravensworth (7811)—Lord Fotherham, 120 gs.
 Victoria 35th, roan, calved Aug., 1859; got by Buckingham (11219), dam (Victoria 23rd), by Baron Waraby (7813)—Mr. Gilbert, 48 gs.
 Victoria 38th, roan, calved Dec., 1859; got by B. B. (15631), dam (Victoria 13th) by Comus (12625)—Colonel Leake M.P., 40 gs.
 Sarah, red and white, calved March, 1859; got by Bolingbroke (14176), dam (Sylph) by Lord of Brawith (10465)—Mr. Lovell, 41 gs.
 Symmetry, white, calved April 18, 1860; got by Old Rookley (15020), dam (Sylvia) by Childers (10052)—M. Le Gros, 38 gs.
 Lady Blanche, roan, calved March 19, 1861; got by Charley (17541), dam (Sybil) by Duke of Cambridge (15742)—Mr. Sheldon, 51 gs.

Frances, roan, calved Aug., 1858; got by Conference (14309), dam (Rachel) by Joe Miller (10355)—Mr. Goaling, 30 gs.
 Abigail, roan, calved March, 1860; got by Sir James (16980), dam (Alice Hawthorn) by Harbinger (10397)—Mr. G. Frost, 32 gs.
 Sybilla, roan, calved Aug. 1858; got by King Arthur (18110), dam (Katherine) by Royal Buck (10750)—Mr. Gilbert, 30 gs.
 Almack's Belle, red, calved Aug., 1858; got by Sir James the Rose (15290), dam (Spicey) by Exquisite (8048)—Mr. C. P. Gell, 115 gs.
 Queen of the Georgians, red (bred by Mr. J. Booth, Killerby) calved April, 1860; got by Prince George (18510)—Mr. Chirnside, 105 gs.
 Castanet, roan, calved March, 1857; got by Prince Arthur (13497), dam (Coquet) by Comet (11298)—Mr. Chirnside, 155 gs.
 Magnolia, rich roan, calved Feb., 1859; got by Majestic (13279), dam (Red Rose) by Vanguard (10994)—Mr. Atkinson, 82 gs.
 Windsor Rose Bud, red roan (bred at Branches Park), calved May 23, 1860; got by Windsor (14018), dam (Red Rose) by Vanguard (10994)—Mr. Waldo, 41 gs.
 Modred, white (bred at Branches Park), calved Feb. 14, 1861; got by Valasco (15443), dam (Mistress Mary) by Baron Waraby (7818)—Mr. Daintree, 35 gs.
 Carina, white (bred at Branches Park), calved Feb. 8, 1861; got by Valasco (15443), dam (Charlotte) by Royal Buck (10750)—Mr. Bland, 35 gs.
 Princess Edward, rich roan (bred at Branches Park), calved Jan. 12, 1861; got by Sir Roger (16991), dam (Princess of Saxo Weimer) by Cheltenham (12588)—Mr. Wortley, 60 gs.
 Rosedale, roan (bred at Branches Park), calved Feb., 1861; got by Valasco (15443), dam (Rosy) by Master Belleville (11799), grandam (Red Rose) by Vanguard (10994)—Duke of Montrose, 215 gs.
 Water Fay, white, calved June 3, 1860; got by Valasco (15443), dam Water Witch by Royal Buck (10750)—Mr. Slater, 34 gs.
 Cherry Rose the 2nd, calved Aug. 8, 1861; got by Royal Hamlet (18769), dam Cherry Rose by Sir Colin (15276)—Mr. Howe, 36 gs.
 Rosy Lass, red and a little white, calved July 13, 1861; got by Royal Hamlet (18769), dam Rosy by Sir Colin (15276)—Mr. Lovell, 26 gs.
 Empress of the East, rich roan (bred at Branches Park), calved Jan. 28, 1861; got by Sir Roger (16991), dam Empress of Hindostan by Duke of Kent (14440)—Col. Lealie, M.F., 80 gs.
 Lily Maiden, white (bred at Branches Park), calved March 6, 1861; got by Sir Roger (16991), dam Baroness by Baron Waraby (7113)—Mr. Bland, 36 gs.
 Castanet, roan (bred at Branches Park), calved Aug. 30, 1861; got by Lord of the Valley (14837), dam (Castanet) by Prince Arthur (13497)—Mr. Macintosh, 130 gs.
 The Lady Edburga, roan (bred at Branches Park), calved Dec. 5, 1861; got by Prince Alfred (13494), dam (Lady Sarah) by Baron Waraby (7818)—Captain Oliver, 80 gs.
 Colling Rose 2nd, roan (bred by Rev. J. Storer), calved Feb. 15, 1862; got by Royal Hamlet (18769), dam (Duchess) by Sir Richard (15297)—Mr. Patmore, 26 gs.
 Rosy Lass the 2nd, red (bred at Branches Park), calved Nov. 8, 1862; got by Royal Hamlet (18769), dam (Rosy) by Sir Colin (15276)—Mr. Williams, 39 gs.
 Katherine, roan (bred at Branches Park), calved Sept. 30, 1862; got by Royal Hamlet (18769), dam Sybilla by King Arthur (18110)—Mr. Lovell, 24 gs.
 Trent Lady, white, calved July 27, 1862; got by Viscount Windsor (19082), dam (Abigail) by Sir James (16980)—Mr. A. Deane, M.P., 31 gs.
 Alexandra, red, calved July 26, 1862; got by Victor Royal, dam (Lady of Bonhill) by Falstaff (14530)—Duke of Buccleuch, 40 gs.
 Sweet Brim, red and white, calved July 2nd, 1862; got by Victor Royal, dam (Moss Rose of Bonhill) by Booth (14180)—M. Le Gros, 31 gs.
 Cherry Rose 3rd, red, calved June 17, 1862; got by Royal Hamlet (18769), dam (Cherry Rose) by Sir Colin (15276), M. Le Gros, 45 gs.

Cherry Twin 1st, red and white (bred at Branches Park), calved Dec. 1, 1862; got by Royal Hamlet (18769), dam (Young Cherry) by Horton Boy (18050)—Mr. Wortley, 23 gs.

Cherry Twin 2nd, red and white (bred at Branches Park), calved Dec. 1, 1862; got by Royal Hamlet (18769), dam (Young Cherry) by Horton Boy (18050)—Captain Oliver, 31 gs.

Victoria Lily, white (bred at Branches Park), calved Nov. 7, 1862; got by British Prince (14197), dam (Victoria 35th) by Buckingham (11219)—Sir A. de Rothschild, 71 gs.

Mildred, rich roan (bred at Branches Park), calved May 18, 1863; got by Prince Alfred (13494), dam (Magnolia) by Majestic (13279)—Mr. Macintosh, 62 gs.

Rose of Hope, roan (bred at Branches Park), calved April 27, 1863; got by Prince Alfred (13494), dam (Rose of Promise) by Hair-at-Law (18005)—Mr. C. P. Gell, 125 gs.

Lily of France, white (bred at Branches Park), calved May 13, 1863; got by Prince Alfred (13494), dam (Joan of Arc) by Vanguard (10994)—M. Le Gros, 23 gs.

Pauline 2nd, red and white, calved Sept. 30, 1861; got by Royal Hamlet (18769), dam (Pauline) by British Boy (11208)—Mr. Bate, 34 gs.

Total, 3,361 guineas.

BULLS.

Viscount Windsor (19082), white, calved June 23, 1860; got by Windsor (14018), dam (Duchess) by Magistrate (10487)—Mr. Goulder, 30 gs.

Royal Prince, roan, calved Feb., 1860; got by Crown Prince (10037), dam (Baroness) by Baron Waraby (7818)—M. Gebhardt, 29 gs.

Brian Borne (17440), white, calved May 4, 1860; got by Dr. Mac Hale (15887), dam (The Queen) by Windsor (14018)—Mr. Butler, 72 gs.

Hair O'Bulieghan, red and a little white, calved Jan. 1, 1861; got by Sir James the Rose (15290), dam (Spicy) by Exquisite (8048)—Mr. Benyon, 34 gs.

Duke Humphry, red and a little white, calved July 31, 1861; got by Lord of the Valley (14837), dam (2nd Duchess of Gloster) by Cheltenham (12588)—Mr. Martin, 40 gs.

Pan, dark roan, calved Dec. 1, 1861; got by Prince Alfred (13494), dam (Woodnymph) by Sir Samuel (15302)—Mr. Sowerby, 61 gs.

Prince Erwald, red, calved March 24, 1862; got by Prince Alfred (13494), dam (Flower of May) by Vanguard (10994)—Mr. Gilbert, 27 gs.

Prince Victor, rich roan, calved Feb. 17, 1862; got by Prince Alfred (13494), dam (Victoria) by Hopewell (10332)—Mr. Maxwell (Ireland), 230 gs.

Comte de Vermandois, red and white, calved Aug. 20, 1862; got by Prince Alfred (13494), dam (La Vallière) by Gainford 5th (12913)—Mr. Crisp, 18 gs.

British Hope, white, calved Jan. 18, 1863; got by British Prince (14197), dam (Isabella Hopewell) by Hopewell (10332)—Mr. Langton, M.P., 58 gs.

Prince of Rosales, white, calved Jan. 24, 1863; got by British Prince (14197), dam (Rosy) by Master Belleville (11795)—Mr. De Winton, 40 gs.

Meteor, roan, calved Nov. 14, 1862; got by British Prince (14197), dam (Belle Etoile) by King Arthur (18110)—Mr. Lovell, 110 gs.

Vindex, white, calved Oct. 6, 1862; got by Prince Alfred (13494), dam (Vesta) by Van (18934)—Duke of Buccleuch, 42 gs.

Early Purl, white, calved Nov. 23, 1862; got by British Prince (14197), dam (Pearl) by Impatience (14738)—Mr. C. S. Read, 16 gs.

Silverstick, white, calved Oct. 31, 1862; got by Viscount Windsor (19082), dam (Symmetry) by Old Rowley (15020)—Duke of Buccleuch, 66 gs.

Prince Cherry, white, calved Dec. 10, 1862; got by British Prince (14197), dam (Cherry Queen) by Hair-at-Law (18005)—Mr. Hull, 30 gs.

Herman, white, calved Dec. 29, 1862; got by British Prince (14197), dam Hildargarda by Highflyer (11576)—Mr. Oldfield, 21 gs.

Lord Chancellor, roan, calved April 15, 1862; got by Lord Chamberlain, bred by Mr. Booth (see forthcoming vol. of Herd Book), dam (Bonne Fille) by Sir Roger (16991)—Mr. Sexton, 25 gs.

Baron Killian, red and white, calved April 27, 1863; got by

Baron Killerby (*vide* vol. XV. Herd Book), dam (Kitty) by Victor Emmanuel (15460)—Mr. Perkins, 21 gs.

Royal Rose, white, calved June 4, 1863; got by Lord Chamberlain, dam (Cherry Rose) by Sir Colin (15276)—Mr. Patmore 8 gs.

Total, 961 guineas.

GLAMORGANSHIRE AGRICULTURAL SOCIETY.

MEETING AT COWBRIDGE.

As a pleasant sequel to our show-yard rambles of this year, we found ourselves, on Tuesday, Sept. 22, at the annual exhibition of the Agricultural Society of Glamorganshire, in a large field just outside the quaint old town of Cowbridge, with its portcullis arch and partially surviving circuit of fortifications; within a bow-shot of the spring whence the garrison drew their water supplies, and which is known to this day as "The Bowman's Well." What a scene it was to make one muse! What with the Cotswolds and the Hampshire Downs, the "Goldfinders," the Bates and Booth blood crossed, those fields

"Had seen another sight,"

since the period when Norman scouts stole out from the adjoining Castle of St. Quintin's, to transfix the fleecy wanderer along the fenny slopes of Penlyne, or "lift" in the woody valley of Llandough, the dark deep-milking kine which the Glamorgan agriculturist of the period reared. This society having been established in 1772, is probably one of the oldest in the United Kingdom, and the most important, after the Tredegar show, in that district. Still, of nothing to speak of a few years since, it appears lately to have taken new life. Upon entering the ground we could not help being struck with the great improvement, both as to quality as well as numbers of the animals exhibited, as compared with what we saw when we were present at this meeting some three or four years back; and, if we except the class of agricultural horses, nearly all the animals shown would have made a very respectable appearance at our more important meetings. Indeed, several of the Herefords have already successfully competed at the Royal and other agricultural shows, viz: Goldfinder, a winner of 25 prizes, including a first prize at Chester, one of Mr. Leyahon's cows, and, we believe, a heifer of Mr. Thomas, of St. Hilary. We endeavoured to go regularly through all the classes, which was practicable enough so far as the cattle, sheep, and pigs were concerned; but when we came to the horses it was quite impossible to judge of the relative merits of the animals composing the different classes, they being scattered about all over the field. Owing, we suppose, to its being rather a blustering day, they were huddled together in groups under the hedges surrounding the field, cart and riding colts and ponies of all ages fraternizing most incongruously. The arrangements, with this exception, appeared to be well carried out; and we would suggest that, in future, stakes corresponding with the number on each horse or colt should be fixed in the ground, and that the animals should be compelled to "stick to their post." Mr. Leyahon shows a pair of good

Hereford cows, and their produce; while Mr. Logan takes the prize with a shorthorn, as the best cow. Mr. Thos. Thomas's Goldfinder, in spite of his age, is still very level, and we understand works well. Mr. Bruce Pryce wins the prize for the best Shorthorn bull under three years, with a clever young bull, bred by Mr. T. Drake, of Shardeloes. For the best yearling bull of any breed, Mr. T. Thomas' son of Goldfinder beat a nice Shorthorn of Mr. Logan's, who also had to be content with running second to Mr. Thomas' Hereford, with two very nice Shorthorn heifers under three years old, but he turned the tables upon him in the next class by winning the prize for yearling heifers. Mr. Donne had it nearly all his own way in the long-woolled sheep classes, as had Mr. Bruce Pryce for short wools. The Berkshire pigs were fair specimens of the breed, and the Rev. W. Holt Beavor takes the prize for the best boar of the small breed with one of the black Suffolk sort, as well as for the best sow of the small breed, with a white sow going back to Lord Ducie's. A prize of £10, offered by the Corporation of Cowbridge for the best bull, cow, and produce of any breed, was won by Mr. Beavor, with his bull The Recluse (18997), of Bates's blood, with a white cow, unfortunately not of "Herd Book" pedigree, but whose dam was of the late Sir Charles Morgan and Sir Charles Knightley's blood, the produce being a remarkably clever roan heifer calf. Mr. Logan, who bought extensively at Mr. Bolden's sale, had to be content with a second prize for his Duke of Knowlmore, with a nice white cow, and their produce. Captain Entwistle got the prize for the best fat beast; and some moderate steers complete the list of cattle.

Having on a former occasion seen the two royal winners, "Newcastle Captain" and "Samson" together on the field, we were surprised at not finding an improvement in the cart horses shown; but really, with the exception of a yearling filly by the former, the property of Mr. Carne, of Nash, they were a sorry lot; and if people will breed by such a wretch as took the first prize here to-day, we have no hopes of the horses of the neighbourhood being improved. "Francatelli" gets the prize as the best thorough-bred stallion. He is a long-legged showy-topped horse, of good colour, with no great power in his thighs, and "Clapham," by Stockwell, a good-looking riding horse, is commended. There were a number of two and one-year-old colts shown, for hunting or carriage purposes; most of them by Captain Ballard's former horse, "Morning Herald," and showing some little breeding, with plenty of power; but many of them of a nasty soft grey colour. Several nice ponies completed the horse division of the show.

THE AGRICULTURAL SOCIETY OF HOLLAND.

MEETING AT HAARLEM.

The pretty town of Haarlem was the scene of this Society's operations this year. Thursday, Sept. 24, it was announced was to be the opening day, as far as the implement and cattle-yard were concerned; but the 24th, 25th, and 26th passed over, and certainly not more than three or four hundred visited this department on the three days. It is true the cattle-yard was not thrown open until the 28th; but, at the same time, the implement exhibitors complain, and not without cause, that they were required to be on their stands, and their implements properly arranged, three clear days before there was any prospect of business being done, for the farmers and buyers did not turn up until the cattle were to be seen. The implements were in covered sheds, and no charge was made for space, while the cattle were all tied up to posts, the same as at our local shows, and removed at night; and, as a matter of course, cattle so exhibited could not be exposed to the wind and rain for a whole week, for rain came down in showers every day. On Monday, the 28th, the visitors poured in, including a great number of the fair sex, who seemed to take as great an interest in the cattle and machines as the opposite sex.

THE CATTLE.

The entries of cattle did not fall below the average, and altogether the show was a good one; but the animals were tied so close together that it was almost impossible to get round and examine them; and besides, with no partition between, there was a chance of getting a lift, as some were not over friendly. The milch cows exhibited were, for the most part, native-bred; and from inquiries made on the spot, several were pointed out which yielded daily almost incredible quantities of milk. Generally, they were in good condition. This breed, it is said, has been imported into England for milking purposes; but the experiment ended in disappointment, while in Holland other breeds are the exception. The bulls exhibited were for the most part good, and, judging from the prizes awarded to both cows and bulls, overfeeding and fattening justly found but little favour with the judges. There were but few entries of sheep and pigs, and were exhibited, not so much for being anything extraordinary, but simply as average specimens of the several proprietors'. Leicesters found most favour; and those on the show-ground certainly were clean, healthy, and showed signs of good breeding. The pigs generally were too long in the snout, and, with the exception of two or three pens, this fault prevailed; and a bystander remarked—an Englishman—"They want a Crisp, or a Sexton, or a Stearn amongst them." In passing, it is to be hoped the Society, if they have the funds, will provide shedding for the cattle another year; for the cattle, in the first place, being under cover, could remain longer on the ground. In fact, there is no reason why it should not be opened a day or so after the implement-yard. It would afford a better opportunity for parties who take an interest in cattle to properly examine the several kinds, and not hurry over them as they are now compelled to do; and last, but not least, it would prove remunerative to the Society, for as soon as the cattle are on view so soon will they commence to take the "ready cash."

The entries of horses were but few, as compared with some of the English shows; still those exhibited were, on the average, good; and looking at some of the carthorses,

one would have thought you were at some English agricultural gathering. The majority possessed fine broad chests, with good and strong understandings, and appeared well adapted for hard work. Some half-dozen of thoroughbred stallions were exhibited, one a jet black, and, with the exception of appearing rather weak in the loins, one could not help but admire him. His head and neck certainly were perfection, and, with the exception before-named, he was a picture. So was also "Tippoo," a bay. At intervals these favourites were walked round, and their appearance certainly justly excited the admiration of every one, and were a credit to their respective owners.

THE SHOW OF FLOWERS, FRUIT, ROOTS, SEEDS, AND PRODUCE.

In the wood close by the ground where the implements and cattle were exhibited, these were arranged on long tables; and here one could not help but say, as far as taste and arrangement are concerned, the Dutch put us in the shade. Whoever the gentlemen may be who performed this arduous task, great credit is due. You may grow fine roots, rear and cultivate beautiful flowers and fruit, make good cheese and butter, and excel in other productions; but throw these anyhow on to rough boards or tables, as we too often see in England, and they lose half their value. Here was one long table, nicely covered over with drapery, under no tent, except one afforded by nature, a beautiful avenue of trees; and on it were, divided into their several classes, fruit, roots, seeds, and productions of the country; and one was at a loss which to admire most. The flowers were not very good; but the season of the year must be remembered. The gardeners of Haarlem rest contented, it is supposed, by producing the finest and best hyacinths and tulips in the world; and thousands of these bulbs find their way to all parts of the globe annually. As was said before, the flowers, though not good, were made the best of; and, instead of placing them on a table, each exhibitor had a tree allotted him, and around this tree, but on the ground, he arranged his flowers as best he could, the number of the exhibitor being fastened to the tree. This arrangement also had a pretty effect: it looked, in fact, like so many flower-beds.

The fruit was exceedingly fine, the apples and pears especially, and it made one's mouth water; while the weight and size of mangolds, turnips, carrots, cabbages, and potatoes were equally astonishing; and in these, it appears, they are able to compete with us. Fine collections of wheat, barley, and other kinds of grain and seeds were also exhibited, and tastefully arranged; as were also cheese, butter, wool, oilcake, &c., in the class of productions. A fee of fivepence admitted us to this department; and the writer must confess he was loth to leave, as were many others, what with the splendid military band, and numbers of the "fairest of the fair," dressed in the height of fashion, but neatly, the flowers and fruit and trees, which exhibited no signs of autumn being near; and one may be forgiven when it is said we got as far as the "way out" once, but were obliged to return once more, as did many others.

THE EXCURSION TO MR. AMERSFOORT'S FARM AT THE LAKE OF HAARLEM.

The show-yard was entirely deserted on Saturday in

consequence of this excursion to Mr. Amersfoort's, who threw open his grounds, buildings, and farm for inspection. The distance from Haarlem is about seven English miles, and an agreeable ride it was. Not far distant from the farm is one of the three engines, of 500 horse-power, used as a pumping engine for draining the tracts of land around. The farm being reached we were introduced, in the first instance, to the field where steam-ploughing was going on. The land was nice and level, and anything but stiff, with a clay subsoil, and just the place for steam-ploughing to be seen to perfection. It was Fowler's direct system; the engine was a 10-horse one, and pulled a three-furrow balance plough, but the self-moving anchor seemed to puzzle the novices in steam-ploughing; they could not account for it, and it was laughable to hear how some settled the point; but the greatest wonder to all was to see "the mere lads" managing the whole of the tackle, the driver of the engine itself being not more than eighteen, while all the others were younger. There was no noise or confusion; each seemed to mind his business, and thoroughly intent upon his work—in fact, to the bystander, one was at a loss to know if there were any difficulties "where they were." The engine propelled itself along the road, and between it and the field ran a nice stream of water, and no hedges of any kind, the engine feeding itself direct from the stream. Seeing this work one cannot imagine why those who have the land to plough, and the capital, should hesitate. Adjoining the field where steam-ploughing was going on, was a field of mangolds, and to see these roots was enough; the ploughing was ten inches deep, and was well done, leaving a nice angle. From the field we were conducted to the fixed machinery. There was a Ransome's engine and thrashing machine, and shown at work, while another strap set in motion a Turner's crushing mill, Bentall's pulper, a grinding mill, and various other machines. In the yard close by was the "tramway" in lengths, of the Messrs. Crosskill's, nicely piled up, ready to be laid down from here to any part of the farm, on which run the trucks, and bring in the produce, for Mr. Amersfoort does not believe in horses for this work. Next came the building where the cows are housed, and a better-arranged place we do not remember to have seen.

Some five thousand people visited the farm, and the day was observed as a holiday by all the people in the village, who were not forgotten. After walking about all day, our appetites began to remind us of something, which for a time was difficult to get. Refreshments were sold in one of the stores on the farm; and, after pushing and squeezing and knocking about for half-an-hour, a sandwich was obtained with difficulty, which had to serve until about nine at night. In passing through the dairy the appetites were aggravated by the savoury perfumes from the kitchen and rooms, where refreshments were being prepared and served up for a lucky few, at the invitation of the worthy proprietor. An Englishman present, not far from the county of Suffolk, cracked a good joke at the time, which was this: He says, "In Suffolk, when a man wants to get a glass of beer out of you, he does not ask direct for a drink, but puts it in this pointed way, 'Pray, sir, if my neighbours should ask me what sort of beer you keep, pray what shall I tell 'em.'" He suggested this joke should be told to Mr. Amersfoort, if we could have seen him; but as we did not at the time, we rushed, as was said before, to the store, and bought a sandwich; and your correspondent is unable to inform your readers whether Mr. Amersfoort's hospitality gave satisfaction or not. He was told the champagne was first-rate.

Several implements and machines were sent from the show-yard, to be shown at work on the farm. Boby's, and Smith and Ashby's haymaking machines, Young's turnip-drill; and also horse-hoes, clod-crushers, and

rollers—all seemed to work well and please the spectators.

THE SOCIETY'S DINNER AT THE CLUB-HOUSE AT HAARLEM.

The dinner was well-served up, and gave general satisfaction. The English exhibitors of implements were kindly invited by Mr. Keyser, of Amsterdam, to be present. His invitation was accepted, it appears, and a very pleasant evening was spent. Several good speeches were made, some confirming the immense good the society had done and is still doing; others urging each member to go forward, for standing still in these days means to be left behind. Another, and not quite without reason, asserted they copied the French too much; and if they still kept on doing so, they would cease to be the people they were in times gone by. One could not help but smile, for this very gentleman had so shaven his beard and so cultivated his moustache that it was impossible for any one to tell that he was a Dutchman until you heard him speak. The healths of the English exhibitors of implements was proposed, which was heartily responded to.

Mr. KEYSER returned thanks for the home-exhibitors, and said as they had borne testimony to the superiority of English-made implements, he hoped they would give a more substantial testimony by coming forward, giving their orders, and testing their superiority on their own farms.

Mr. E. R. TURNER (of the firm of Messrs. E. R. and F. Turner), of Ipswich, was deputed to return thanks for the English exhibitors. He thanked them each and all for the very hearty manner in which they had drunk their healths, and he was sure that he was speaking the truth when he said his brother-exhibitors present wished the Society all the success it wished for itself, and he hoped, for many years to come, it would flourish and prove beneficial to their very interesting country.

With several other toasts and speeches the meeting broke up, after spending some four very agreeable hours together.

THE IMPLEMENTS.

This department was worse managed—in fact, mismanaged from beginning to end; so much so, that it would be useless to give a complete list of the prizes. In the first place, instead of the various machines being brought out and tried side by side, many implements for which prizes were offered were not looked at, while prizes were given to other machines after a few questions had been answered; the judges, in fact, existed in name only, for, to the surprise of all, both successful and unsuccessful exhibitors, the prizes were awarded before they knew the machines had been looked at. Some complained, others vowed they would take their things out of the yard at once, for on Thursday night the principal part of the machines were not finally arranged; in fact, on Wednesday only were the sheds finished and covered, and on Friday, before breakfast, to the surprise of all, the prizes were affixed to the machines. Turner, of Ipswich, for instance, received the gold medal for their engine and machines; but he frankly owned that he had a lot of sheaves brought him for the purpose of testing his machine and engine. A sheaf or two was thrashed just to see that the machine was all right before trial, but the next morning he found the prize awarded to his machines, although undoubtedly they were the best.

Boby's haymaker, Richmond's chaff-cutters, and several other machines were not looked at until the prizes were announced; then another set of judges came and awarded them medals also, in a few minutes; but the exhibitors before mentioned declined to receive their awards at such a time, and spoke their minds pretty freely on the subject. All sorts of excuses were

urged, the steward saying it was the judges' fault; while they urged, on the other hand, it was the steward's. But the fact is, one could plainly see there wanted a directing hand in the implement yard; and unless some great change for the better takes place, English exhibitors will not go all that distance, and be treated and bandied about as they were at Haarlem. It is right the members of the society should know it; for the remedy is in their hands to choose fit and proper persons to fill the two offices of secretary and steward, and these to see that the judges do their work fairly and without partiality, as was said at the commencement. On the 24th, 25th, and 26th nothing was done in the way of business; and these three days might fairly have been occupied in trying and testing the various machines, as it is understood that exhibitors do not object to have a thorough testing of their machines, instead of just skipping over them in an hour or two. It is hoped before next year the complaint now made will be remedied, or the members may rest assured the English exhibitors will not come at all.

Bentall, of Heybridge, had a nice stand, and he exhibited some thirty of his best machines.

Messrs. Turner, of Ipswich, exhibited their useful and well-made engine and thrashing machine, which created a great deal of interest. The machine, being simple and well made, seemed to please the farmers much.

Boby, of Bury St. Edmunds, exhibited his patent double-action haymaking machines, patent corn screening and dressing machines, and patent horse rake. These machines were well made and finished, and shown in operation, and their efficiency is everywhere acknowledged.

Ashby and Co., of Stamford, exhibited their little steam engine and thrashing machine; also a saw bench, which, when at work, attracted great notice. They also exhibited their haymakers, horse rakes, rotary harrows, and chaff cutters.

Sawney of Beverley, exhibited his dressing-machines and his patent Excelsior harrows.

Young of Ayr, Scotland, exhibited his patent turnip

and mangold drills; these drills were highly spoken of by parties who have them in use in Holland.

Keyser and Co. (late Keyser and Swerts), of Amsterdam, deservedly received the Great Gold Medal, for the best collection; they had a splendid stand, some 100 feet long, of all English-made agricultural machines; it was beautifully arranged, and on the stand could be found all the best agricultural machines from most of our eminent makers—Hornaby's ploughs and drills; Ransomes and Sims' root-cutters, ploughs, and grinding-mills; Turner's crushing-mills; Barrett and Exall's horse thrashing-machine, with horse-gear and intermediate motion; Boby's patent screening-machines and haymakers; Richmond's chaff-cutters; harrows in every variety; clod-crushers of Messrs. Crosskill's; Spear and Jackson's patent steel forks and spades. In fact, a farmer had only to come on to this stand, and he could, in a very short time, supply himself with all the necessary implements for managing a farm. Great credit is due to such firms, for they come to England and see and judge for themselves as to the machinery best adapted for the country; they also buy them, try them, and through the perseverance and energy of this firm many of our best agricultural machines find ready purchasers. It is far preferable for the farmers of Holland to have such firms and mediums as these, in preference to such as set themselves up as agents, and at the same time keep no stock, and risk nothing, and oftentimes know nothing of the machine they are ordering. If they will do so, they must not blame the makers on this side of the water.

Mr. Swertz did not exhibit on this occasion, his warehouse not being yet completed.

The town itself presented a very gay appearance during the show, flags and banners flying from all the windows. Sunday was a gay day, and numbers visited the yard, but the English exhibitors set a good example by allowing their stands to take care of themselves. Altogether the meeting was an interesting one, and one that we hope proved remunerative to the Society.

PREMIUMS TO LABOURERS.

At the dinner of the Abingdon Agricultural Society, on Tuesday, the following letter, addressed to the secretary, was read from Mr. Walter, one of the members for Berkshire: "Bearwood, September 8: Dear Sir,—I regret that I cannot avail myself of the invitation which I have had the honour of receiving from the Committee of the Abingdon Agricultural Association to dine with them on the 29th inst., but I hope to have the pleasure of meeting many of the same party at a later period of the year. I am glad to hear that the Society is out of debt, and hope it will keep so; but in reply to your invitation to me to become a subscriber to its funds, I regret that I must decline to do so, so long as any portion of them is applied to purposes of which I highly disapprove, and to which I have often publicly stated my objections. I allude to the practice of rewarding each other's servants out of a common fund for long services, a matter of which a society cannot be the proper judge, and can have no right therefore to take cognizance. Without troubling you at greater length, I will only observe that classes 6, 7, and 11 in the Society's programme exhibit this objectionable, and, as I think, most mischievous practice, and I regret very much that, under the auspices of a new Committee of Management, it has not been thought proper to dispense with them.—I remain, dear Sir, yours faithfully, J. WALTER." It is satisfactory to say that,

notwithstanding the terrible "*I highly disapprove,*" the prizes in the classes thus condemned were all duly awarded, while Mr. Duffield, the President of the Society, referred very happily at the dinner to "persons who were deeply steeped in political economy, and took a political-economy view of those matters, and subjected the rules of that Society to their rigid principle; but he thought this was a mistake. They were not to reward a man for being honest; and it was said if a man got a good place he was sure to keep it, or he must be a great fool to leave it, and the master must be a great fool to turn away a good servant. That was very true; but there were other things to be considered. There was the praiseworthiness of a man's conduct, and there was a man's honesty. Supposing a political economist were to see a man on a farm, who had been there for nearly a century, and without seeing his face the owner would hardly know the farm, because he had been accustomed to it ever since he knew the farm; and if the political economist should say to the owner, on seeing the decrepit old man, 'Why employ such a wretched labourer as that, who is supporting himself with the hoe he has in his hand?' The farmer would say, 'Do you think I am going to discharge the poor old man because he is decrepit: my grandfather and my father employed him, and I am going to keep him while he lives.' This

might be false political economy, but the landowners did not always consider a man according to his money value. It was not like mere trade—buying in the cheapest market and selling in the dearest. There were a great many *etceteras* in this matter. They must look upon it in a different way from that of political economists. Why should that Society not stand in a similar position to the Queen, who rewarded soldiers for long and good service? He supported that Society with great satisfaction, and he believed all who did so, were doing their duty both to God and man, and to that society in which they lived."

There is scarcely a farmer in the country but would

follow Mr. Duffield, as the meeting did, with "loud cheers;" and yet, forsooth! the good deeds of the association are to be put under the ban of the high disapproval of Mr. Walter, who in this as well as in many other respects does not seem to go much with the wishes of his constituents. What with maintaining the Malt-tax, turning the police into game-watchers, and keeping aloof from all such societies as do not fall in with certain peculiar crochets, the representation of Berkshire, so far as the agriculturist is concerned, would seem to be something rather worse than a dead letter; the more particularly as Mr. Bouverie says and does pretty much "ditto to Mr. Burke."

AGRICULTURAL MACHINERY: LABOURERS' COTTAGES.

At the dinner of the Norton Farmers' Club, W. FOWLER, Esq., of Whittington, said: "Any one who visited a large agricultural exhibition must be struck by the vast changes that had been effected by the introduction of machinery. Mechanical appliances are now applied in every direction to economise labour and reduce cost, and he believed that very soon they would see a change of this description—large farms adapted for the growth of corn would be specially laid out, and the requisite mechanical appliances provided for that purpose. They might take it for granted that with free trade in corn, which had caused our imports to increase fully 300 per cent. between 1852 and 1862, and with the vastly increased facilities for intercommunication by road, river, and rail that we now possess, the price of corn will never again, or at least for a very long time, rule high. But there was compensation provided even for this drawback. Free trade in corn and other articles had brought about the commercial prosperity of the country; and owing to the briskness of trade and the large increase of population, the farmers had found the demand for their produce steadily increasing. The consumption of beef and mutton had enormously increased, and from that demand the farmers would receive the profits that perhaps were denied to them from the cultivation of wheat. There had been great importations of cattle from abroad, and he was sorry to say that we had imported with those cattle diseases previously unknown in this country; but he did not think the importation of foreign cattle would ever seriously embarrass the native breeder. These observations led him to observe that this district is better adapted for breeding purposes than for the growth of corn; and he recommended the farmers to turn their attention to breeding profitable cattle and sheep. It was incumbent on them to use every means in their power to make themselves masters of the most improved appliances, and to use their land for the purposes to which it was best adapted, if they wished to improve their position in the agricultural world.

CHARLES CANNEL, Esq., the President of the Club, said: "He was much obliged to Mr. Fowler for his remarks on farming. He quite echoed what had fallen from Mr. Fowler, and assured every member of the Society that it was his earnest desire to do for the Club all that would conduce to its prosperity. He believed the prosperity of the district would be better promoted if the farmers turned their attention more especially to the breeding of cattle, instead of growing corn. He referred to the early history of the Society, which was commenced as a ploughing club, and expressed a hope that in future more valuable premiums would be offered for the best ploughing, in order to induce farm servants to attain excel-

lence in that particular art. He also hoped that whilst the farmers were becoming more and more attentive to the feeding and housing of cattle and pigs, they would not forget the condition of the agricultural labourer. They were striving to give animals good shelter and good food, and perhaps in their zeal they might overlook the cottages in which their servants lived. Last year he made some similar observations, but he now wished to bring the subject more prominently before their notice. He would be very glad and willing to give a liberal premium, or even to build a model cottage on a plan adapted for the residence of farm labourers. Anything the members would suggest should receive his careful attention, and any scheme that promised well he would willingly carry out. He repeated that he should be glad to give a prize for the best cottage—one in which economy was not sacrificed to a pretentious appearance, but which would be really useful and serviceable to the labourer, and would not entail upon him greater trouble and expense than it was worth. He hoped the members would give their attention to the matter, discuss it freely and, and communicate either with him or the secretary, and that course which they as a body deemed best he would certainly carry out.

MR. BARROW, said: "I have to thank my friend Mr. Crawshaw for giving me an invitation to become a member of this Club and join with you to-day. I accepted the invitation, not because I occupied a few acres of land, but because I wished to show, as a commercial man, that the manufacturer and the agriculturist may put up their horses together. Although I occupy some 500 acres of land in this parish, I know nothing about farming. I scarcely know a field of mangolds from a field of swedes, or a field of barley from one of oats; but this I know, gentlemen, that the farmers of this country have exercised such talent and such perseverance, combined with such excellent management, that they have produced within the last few years—and especially during the present season—crops probably better than have been known before. We may be thankful—we ought to be thankful—to Providence for the fine season we have had, but the large yield we have had is mainly attributable to the improvements in farming which have been brought about, and the care which has been taken to adapt the crop and the system of tillage to the nature of the land. It has been said that agriculture and manufactures have a mutual interest. I will show an instance of this on the spot. There is not an individual in Staveley Works who is not benefited by having good meat bred and fed under their own noses. They have good corn and good flour grown and ground under their own eyes, and they have good milk and butter brought to their own doors. And how does the farmer stand? He gets good prices for his produce from the increased demand. His labourers get good wages, and his daughters get good husbands. In conclusion Mr. Barrow expressed a hope that the two would remain in harmony.

THE PRIZE AGREEMENT AWARD.

At the Rugby Show, the Earl of Lichfield, the Lord Lieutenant of Staffordshire, took occasion, in returning thanks for his health being proposed by Mr. R. C. Chawner, the chairman, to refer to the prize agreement. We take the extract of his lordship's speech, and the discussion which followed, from the *Staffordshire Advertiser*.

His Lordship said: I must now ask you to allow me to offer a few remarks upon a subject which is more intimately connected with the occasion of our meeting here to-day. I wish to do so more especially in consequence of some misapprehensions which have taken hold of the minds of some persons with regard to what has taken place in connection with the award of the prize to the best agreement selected by the committee appointed for that purpose. In the first place I must remark upon the mistake which appears to have been made first in the report of what I said at Stafford with regard to the publication of the agreement. I am sure that a paper with the wide circulation of the *Staffordshire Advertiser*, and one which is so much appreciated in this county, can afford to allow me to find some little fault with the manner in which the proceedings of the dinner at Stafford were reported. I must say, in the first place, that if the little fault I am about to find is as I am about to state it, I do not think after all we shall consider much blame attaches to the reporters. At the same time I do not think they would wish me, merely for the sake of their feelings, not to mention the fact. Now the great fault I find with the report which appeared of that which must after all be considered as one of the most important meetings which can possibly be held in any county, is not that a few observations of mine did not catch the reporter's ear exactly as I intended them, and as I believe I expressed them, but that some very important and remarkable speeches, I may say, were not reported at all. This was possibly owing—and as I am finding fault I may just as well endeavour to explain—to the fact that there was undoubtedly considerable delay in consequence of the weather that day, which prolonged the proceedings of the dinner to such a late hour that it appeared really impossible that the proceedings of that dinner should have been reported on the following morning. I only think it would have been better for notes of the proceedings to have been taken to the end, and for the report of the speeches to have been given the following week. I say this because there was a subject brought under the consideration of the meeting which is, perhaps, one of the most important which has been considered at any meeting of any agricultural society throughout the county. I, in some observations I made, referred in a very few words to the agreement which had been selected for the prize, and I did not go so far in explanation of its provisions as I otherwise should have done, because I particularly said at the time that, knowing that the person who had written the agreement would have an opportunity of making some observations upon it, I thought it would be better that the description of the agreement should come from him than me. I encouraged these remarks on the part of Mr. May intentionally, because I felt if I had gone more closely into the provisions of that agreement it would really have been taking the words out of Mr. May's mouth. Therefore it was I regretted extremely that a very important part of the proceedings of the evening could not have been reported on the following day. In fact, at the dinner, in consequence of there being considerable noise in the room, I was unable to hear what was being said, and I mentioned this to Lord Harborough, who sat on my right, and who made the remark, "Well, we must console ourselves by feeling that we shall have it reported in the paper." Having said so much, I must now mention that point which it is necessary to refer to, and upon which there appears to be so much misapprehension. Now, with regard to what I said, I really have not a word to say as to the report, because it would have been perfectly impossible for any person reporting a speech to have given more exactly, far as it went, what I said upon that occasion. But there is mainly was one little omission, and it was so slight a one that a reporter was very little to blame. It was with regard to

my having stated that it was the intention of the committee to publish the agreement which had got the prize in the shape which they had intended to put upon it. I can scarcely believe it is necessary to assure any gentleman here present that the idea of mutilating the agreement, or changing it in any way, could never have crossed the mind of any one member of the committee, and I have taken several opportunities of asking those who were present at the dinner whether I had been unintentionally guilty of making a remark which really would have thrown such ridicule, I may say, upon the proceedings of the committee over which I presided. I certainly must say that those who were present bear me out in asserting that what I said was, that the committee, although they were perfectly unanimous that the agreement selected was the best of the agreements sent in, found the subject required so much more consideration than they had expected, that they intended, before publishing that agreement, to see in what way it could be improved upon, and to draw out an agreement of their own, and to publish that agreement with the agreement which had won the prize. And I really do not think the committee can in any way be blamed for such a proceeding, because it must be remembered that if that agreement had been published upon that day the committee would, in point of fact, have committed themselves to that agreement without the opportunity, which they were naturally anxious to have, of pointing out wherein they thought it might have been improved. I think the committee, to a very great extent, would have defeated the objects they had in view if they had acted otherwise than they have done. I quite allow that the question is one of so much importance that more delay in coming to a decision than is absolutely necessary would be undesirable; but, because it is a question of that importance, I am quite sure the public would be sorry to see the committee come to a decision without very careful and very mature consideration. I hope they will be in a position at any rate in the course of the next two months—and I mention that time because it is just as well to be on the safe side—to publish both agreements—that is to say, the agreement of Mr. May as it was sent in to us, and also our agreement as we may think fit to draw it out. But there is another point with regard to what has taken place on this subject which certainly requires the most direct and flat contradiction on the part of one who has taken so active a part in this matter, and that is a statement made in the letter which appears in last Saturday's *Stafford* paper, and signed, I think, "One of the Unsuccessful Competitors." In that letter a statement is made that the person who obtained the prize for the best agreement was a member of the committee who selected the agreement. Now I really believe, as far as those present are concerned, and as far as the public generally are concerned, that this ridiculous assertion can scarcely require a contradiction; but it just induces me to put before you the manner in which that committee was composed, which, perhaps, may not hitherto have been made sufficiently clear to you. When I offered the prize for this agreement I left it very much to the society to say how the committee which was to award the prize should be constituted. As you are all aware, the Staffordshire Agricultural Society's Committee is composed of representatives of a very great number of districts in the county, and it fell to the lot of those gentlemen to elect, or rather to nominate, twelve tenant farmers to serve upon the committee, and this they did. Mr. May, who has obtained the prize, was one of the representatives of this district; and it will be very easily understood by every gentleman present that there was some discussion even upon this point—the question arising in several minds, "Shall I serve on the committee, or shall I send in an agreement?" because there were several gentlemen who were representing the different districts of the society who would have been able to send in as good an agreement as any produced; and it was therefore a question whether their services would be really more important in the drawing up of an agreement to be sent in to the committee, or in acting upon the committee. In one

or two cases there was some question as to which they should do; but I do not think that anybody will suppose for a moment that any tenant farmer in the county would have thought for an instant of acting upon that committee, he having sent in an agreement. Therefore, without really condescending to contradict what in itself is so absolutely ridiculous, I think it is just as well to point out the manner in which that committee was constituted. I have no doubt in my mind that this is a matter which has been well considered by almost all the tenant farmers and landlords who have taken an active part on that committee, neither have I any doubt that some of the landlords, as well as the tenant farmers, have had some conversation on this very subject, for anything I know to the contrary, with the very person who obtained the prize. All I can say is, that from the manner in which the agreement is drawn up I should have been glad to be placed in communication with him some time ago, for it is quite clear he could have given me very important information, to which I might have had an opportunity of alluding upon occasions when I have thought it necessary to introduce the subject. Therefore I think it was more than probable, indeed I think it amounts almost to a certainty, that in many cases those who have been sending in agreements have also talked the matter over with those upon the committee. Well, there is one other point which ought to be corrected, and that is the statement which is made by the editor of the *Stafford paper*, in the very appropriate remark which he made at the end of the letter to which I have just now alluded, and in which he himself contradicts of his own knowledge the statement of the winner of the prize having been on the committee. He goes on to say that the forty-seven agreements which were sent in for competition are all going to be published by the committee. That really is not the case, nor is it possible the committee should have undertaken such a work. And now I am upon this subject, I should like to say one or two words about the 46 unsuccessful agreements. In the course of our inquiries, and in going through the agreements, we came across a great many which, although they contained objectionable clauses, also contained here and there clauses which I think of considerable value. Some of those clauses I think well worth extracting; and I want to know, before those agreements go out of my hands, if any of the gentlemen who sent in those 46 agreements can see or wish to raise any objection to our extracting those few clauses which we think of value in those agreements which have not been successful. It is quite clear that amongst the unsuccessful competitors there will be some who will be discontented; and I think it is possible, supposing such a course was adopted by the committee, that they would lay themselves open to blame on the part of some of the unsuccessful competitors if they were to take advantage of those clauses which they think valuable, without giving them notice that they intended to do so; but having said this much, it remains with all those gentlemen who have sent in those agreements at once to write and request them to be returned, and then of course they may be sure that they will be returned to them at once, and that no advantage will be taken of them beyond the impression some of the clauses may have made on the minds of the committee in reading them over. I have thought it necessary to delay you on this subject, I must say, rather an unreasonable time, but from the first moment I took it up I have every day felt its growing importance. I am perfectly satisfied it would be impossible to over-estimate the importance of a sound conclusion being arrived at, before they separate, by the committee which has taken the matter in hand. I cannot touch upon the importance which I attach to this subject, without returning my thanks to one to whom I think our thanks are justly due for the interest he has taken in this subject, amongst many others connected with agriculture, and upon which he has on many occasions addressed the tenant farmers of this county. I need scarcely say that I allude to our chairman. It is not to be expected, and much less is it to be desired, that we should all agree upon everything, because this world would scarcely be worth living in if we did, and it was not very likely we should all agree on this subject; but one thing is very satisfactory, and that is, that you have got together twelve of the leading and most intelligent tenant farmers in the county, together with an equal number of landlords, and that they have had no question brought before them on which they were disinclined to come to a reasonable, a fair, and a practical understanding. That is a very satisfactory feature in itself,

and will, I think, be a sufficient reward to anybody who has taken part in the proceedings of the committee which awarded the agreement. I have heard very little said against the objects which the committee had in view, for this simple reason—that there is nothing to be said against it, though there will always be persons to raise difficulties and find fault where there is not much occasion for doing so. I have heard there are a very few people who do not believe in the object which the committee have in view, and one of the very few remarks I have heard which at all tend to throw any sort of doubt upon the object which the committee have in view was an expression which I heard made use of myself, and I have been told has been heard by others—"Oh! this is all very well, but it is of no use." Now, really that is about the only thing which has been heard against the object of the committee, and what does it mean? Does it mean that no alteration was necessary? or does it mean that the committee who have it in their hands will come to such an unsatisfactory conclusion that the agreement, when it is produced, will be of no use? It must mean one of these two things, as it appears to me—either that a change was not wanted; or that the change, when brought about by the committee, will be of no use, or will not be generally adopted. I am happy to say that since the meeting at which the successful competitor was announced I have seen remarks made by more than one large landed proprietor, and especially by our friend the Earl of Shrewsbury, expressing approval of the object of the committee. At the same time that Lord Shrewsbury did this, he expressed what I hope and believe to be the feeling of most of the large landed proprietors in this county, namely, that they are upon the whole satisfied with the existing understanding between themselves and their tenants. He evidently meant by the remarks which he made upon a late occasion, that if he sees anything in the agreement which he believes will have the effect of promoting the interests of agriculture throughout the county, he will be one of the last to refuse to adopt it; but that certainly, unless some very decided improvement is set forth, or shadowed forth, in this agreement, he naturally would be satisfied to leave things as they are. I must say it is a very great satisfaction to know that he is a member of the committee, and that so many large landed proprietors as we have upon the committee are anxious to adopt a form of agreement which will set at rest a question which has undoubtedly created a vast deal of misunderstanding, say what you will about it—put it in what words you like—between the owners and the occupiers of land. The real reason of that misunderstanding is this—that in this county, somehow or other, you have no sort of principle to set upon, not even that of leaving disputes to arbitration; and what is more, you have no hope of getting a principle in any shape, except through an agreement which shall be universally adopted. The only other way is through the custom of the country, and that you cannot get for twenty years, supposing the custom were now universally commenced. Under the most favourable circumstances, supposing you do not obtain an agreement such as that which the committee and Mr. May propose to give you, it may be thirty or forty years before a custom of the country can be established which will put an end to those misunderstandings to which I have previously alluded. His Lordship then retired amidst applause, and, after a short interval,

The CHAIRMAN said: The Lord-Lieutenant has given a retrospect of another meeting, which has rather tended to destroy an opportunity for practical discussion during the rest of the evening. As I am diametrically opposed to his lordship on many points, I would rather he had remained to hear the few remarks I have to make than read them in the *Staffordshire Advertiser*. Referring for a moment to the subject upon which the Lord-Lieutenant has expatiated—that is, the agreement—I may say I believe it was at a meeting of this society that he first expressed his intention of offering a prize for the best agreement between the owner and the occupier of land. Well, to that agreement I will not refer, because we are taught of the deed to say nothing but what is good. I will say nothing of the agreement, because to you and me it is still unborn. We know nothing about it; and we know still less of that subsidiary agreement which, by extracting every bit of brains there may be in the other forty-six poor competitors—promises to give to the county a model agreement for the future. Now, gentlemen, I shall only make few remarks as regards, not Mr. May's agreement, for I shall not

be so presumptuous as to allude to that, but as regards that agreement which is to supplement his agreement; and I will say that if it does not provide for two points, it is not worth the paper upon which it is written. Those two points are these: First, unless it abrogates, root and branch, every restriction upon the cultivation of land, it is not worth a half-penny. Look at the seasons we have to contend with in this country, and look at the markets of the world which are open against as well as for us, and then to tell me that any man or any committee of men are so eminent in agricultural matters that they can lay down a course of husbandry which shall suit all climates or please all markets, is an absurdity. Now, gentlemen, I met with an instance the other day, in Lancashire, where a large occupier was not confined by any engagement whatever as to a course of husbandry. He, in common with other people, knew that the price of wheat, in the event of a good harvest, would be very low; and he took more than eighty acres out of his course, which he would otherwise have sown with wheat, and planted them with vetches and tares. He put sheep upon them in the spring, and kept them there till the second week in May, much to his advantage, for he was a stock-keeper. He then took the sheep out, and allowed the vetches to go to seed; and the consequence was, that he had thirty bushels an acre, which he sold at 50s. a quarter. Surely he was better off than if he had been compelled to sow wheat over the whole breadth. This shows that the man who is free, compared with the man who is bound under any system, must meet with success, while the other meets with failure. Take another question, which if this agreement does not tackle, it is of no use—that of incoming and outgoing tenants. The Lord Lieutenant's words were true enough with respect to the difficulties as to the custom of the district. It so happens that I am at the present moment an example of the stupidity and dishonesty of the custom of incoming and outgoing tenancy, and a victim of the same. Take one instance: I gave up more than 600 acres of land last Lady-day, and of course there was a portion of it sown with wheat. I am told by my own valuer, as well as by the valuer against me, that wheat planted in the autumn of 1863 will be accounted for in the spring of 1864. That is a pretty business, I should think. I spend my capital in 1863 in cultivating the land and planting wheat, and I am to receive my portion of it back again in 1864; and in the meantime the incoming tenant takes the corn to market, and makes use of my capital, instead of my making use of it myself. That is one case, and there are others equally unjust, with which I will not trouble you. If the model agreement does not satisfactorily dispose of these two difficulties, it will not be adopted generally, and will scarcely be adopted partially, throughout the county. If I am not trespassing on your time, I should be very glad to ask your attention to a very serious subject, in which we are all concerned, and in which many who are not either owners or occupiers, but consumers of our produce, are equally concerned. You know pretty well what the price of wheat is now; but you have no opinion as to what it will be in the future, and no control over prices. The great law of supply and demand must override that, as it does everything else of the same kind; and therefore the question arises, Can you meet the difficulty? It has been said, I do not know with what truth, that every industrial class in this country has found the means of cheapening the cost of the production of those articles which they bring to market, with the exception of farmers. It is a serious fact that the expense of producing a quarter of wheat is as great as it was fifty years ago, with prices how different I need not tell you. I say it is a very serious fact for us to consider whether we cannot lower the cost of production. You cannot influence prices, and you must therefore work at the other end of the problem, and lower the cost of production. If, in lowering the cost of production, you can by any system increase the produce per acre at the same time, then there is no reasonable man who would not adopt that system. I know of no power which will enable us to do that except the general adoption of steam cultivation in the place of horse-power over the lands of this country. It was my fortune some years ago to hear the late Robert Stephenson utter what appeared to be almost a prophetic truth. It was this: That the extraordinary transactions of this country—the conveyance of goods, and the remarkable commercial transactions of various kinds, had become so vast,

that the tractive power then used—that is, the horse—was unequal to it, and that but for the intervention of the rail and the locomotive, the country would have lost its position among the nations of the earth. It does seem hard, while all other industries are deriving the benefit of this great power, that we have only partially adopted it. We have adopted it to bring our corn to market, but not generally in the cultivation of the land, and in the production of that corn. There can be no doubt that the introduction of this great motive power on to our farms would be very beneficial, but there are a great number of practical difficulties which arise to prevent its application; and, therefore, I venture to ask your attention to the fact that a company has been established in London, and I am very glad to see that the same idea has been taken up in this neighbourhood, and I hope it will be carried out, with probably its centre at Birmingham. A limited liability company has been formed by owners and occupiers of land, and others interested in that class of property, which will enable any occupier of land, or any two jointly, to order a set of what are familiarly called steam tackle. The society will not restrict itself to Howard's or Smith's, or any other maker's, and therefore our excellent secretary, Mr. Mellard, may perhaps come to our rescue. He is an energetic man, and stands well amongst those who are spreading steam cultivation throughout the country. The true object of the company is this: It is to be founded upon this simple principle, that the shareholders will sell this steam apparatus to anybody who will ask for it, and will extend payment over a series of years, not asking anybody to lay down a large sum at once—for the cost would be considerable, say six or seven hundred pounds—but, as I say, extending the payment over a series of years, on security being given. If that scheme can be brought to bear, I think, gentlemen, you may look your difficulties in the face without dismay. You know that steam not only reduces the cost of production, but it overcomes the difficulties which the very short periods of fine weather we have create in the cultivation of strong land; and, further, it should be remembered that horses—your motive power now—are always consuming food, whether they are at work or not; but the steam horse only consumes food when it is actually at work. Gentlemen, I have ventured to direct your attention to this subject. I believe it to be a very practical one; but there is one point connected with it which, if you will pardon me from trespassing upon your time, I cannot omit. There must be a combination of all who are interested in land to carry the new system through with success. You must have the owners of the land, you must have the occupiers of the land; and you must have the labourers on the land with you. I do not believe, when it is put to them in the right manner, the owners will shrink from their duty. I know perfectly well that the owners of land have seen examples of the way in which improvements have been made by steam cultivation, so that they cannot say they will not set their estates in order, but must begin by grubbing up useless fences and hedge-row timber, which may be very charming to the landscape painter, but to an old farmer like me are not charming at all. I believe the landowners will consider this point. There are instances in which tenant-farmers are called upon to make these improvements, but it is a bad principle for owners to call upon tenant-farmers to expend their capital upon permanent improvements, which the owner ought himself to make. I know from experience in various counties that tenant-farmers have not more capital than they can profitably employ in stocking and cultivating their farms; and therefore I say that the permanent improvements ought to be undertaken by the owners. Then you must take the labourers. If I say that when you have steam power your labourers will become skilled labourers, and consequently will demand and earn more wages, you must not shrink, because that is a different kind of labour from that which is very little superior to common brute force. And here again the landlord must do his duty. He must not, in providing accommodation for the labourers, look for a return for the capital employed; but he must consider it as a point of duty. He must remember that a well-cultivated estate and a well-affected rural population are his security, and ought to be his pride. Gentlemen, when I look forward and see that these relative duties are well understood between landlord, tenant, and labourer, I am led to believe that agri-

culture will take its proper rank with the manufactures and commerce of the country, and I certainly look forward to the time when by all, as it is justly now by some, it shall be considered the foundation of our prosperity. I look forward to the time when these classes shall know and shall act upon their several responsibilities, and when agriculture shall become the crowning glory of our native land.

Mr. MAY said: There cannot be two opinions of the quality of the show held to-day, which was one of the first order. There were a number of very good animals in every class, and in one of the classes over which I had the pleasure of judging there were two pens of some of the very finest sheep I ever saw in my life. It is very seldom indeed in any society that such beautiful ewes and such fine ewe lambs are shown, and the ram lambs were extraordinary. As regards the other portions of the show, I should say that they were good. All the young stock was excellent, and the bulls were exceedingly good. And now allow me to make one or two further remarks, as my name has been frequently mentioned of late, and sometimes very unpleasantly. I should, when I was at Stafford, have had great pleasure in saying a great deal more than I was allowed to say. I was told that I should have to say something, but I sat until I nearly fell asleep—until, in fact, about nine o'clock, before I was permitted to say anything at all. The room then, as this room is now, was considerably thinned, and I have no doubt that hundreds who came there to hear something about this said agreement went away disappointed. Gentlemen, that was not my fault. Had I been allowed, I would have told that meeting, as I would tell you now if I had the agreement with me, all that it contained. In drawing up that agreement, my simple wish was to do justice between landlord and tenant. I do not think it will be liberal enough for Mr. Chawner. Though I think Mr. Chawner has very sound views on a great many things, I do not think if I were a landlord I should allow a tenant to crop just as he pleased. There is no course of cropping in the agreement, but the tenant is not allowed to take all the white straw crop. He is limited in every year of his tenancy to take a portion of green. If a man had to leave a farm suddenly, either by his own wish or his landlord's, and had cropped in an extraordinary way, how would the land be fit for anybody to enter upon it? (The Chairman: Dilapidation.) I think all farms ought to be cultivated well. I would give every tenant the greatest latitude I could, but, at the same time, I would not lose sight of the right of the landlord over his property, but keep it in a state in which he would be able to pass it into other hands. To say you would have dilapidations, is only to say that you would have law which, if I were not in the presence of lawyers, I should say you had better keep out of. My wish was, in giving that agreement, to give one which could be adopted. I do not think a one-sided agreement would have been fair, and I can assure you, as far as regards myself, and as far as regards my position as a tenant farmer, I wrote the agreement as one which I should be willing to farm under. There were several questions which were very puzzling, and there were several clauses which, I candidly confess, I scarcely knew how to draw up. Some one has asked the question in that letter, whether I had any communication with any members of the committee. I can only say there was no gentleman who sent in an agreement who did not communicate with his friends. Now, on all point of difficulty it is very natural to ask the opinions of others, and I preferred seeking for the opinion of living brains to that of dead parchment. I did not go to old forms. I simply sat down in my own house to write out the skeleton of what I thought a fair agreement; and when I came to such a question as game, I said to myself, "How is this to be dealt with?" I thought it over in various ways, and I came to the conclusion it was no use having a clause that would compel a landlord to pay for damages done by game. I think such a clause would be a source of continued unpleasantness. I fancied within my own mind there was an inclination on the part of landlords to be more honourable and more just as respected game than was formerly the case. I knew that sport was inherent in the English character, and that it ought to be fostered. We are all fond of sport, and every Englishman who is, is a better Englishman than if he was not; but I would have that at the expense of the tenant. I hold that every tenant who takes a farm is bound to reap the benefit of that farm. If he takes it as a game farm at a lower rent, he is a fool, because you never

know the amount of damage which may be done; but there is a clause to the effect that if a landlord lets his game to a third party, and that third party injures the tenant, the landlord shall make compensation, because it would be simply absurd as well as unjust that a man should receive money from a third party at the expense of his tenant, and not reimburse him for any loss. As regards cropping, as I said before, a large margin is given to the tenant. He is allowed to crop as he pleases, but two-fifths of the land must be in green crops. The agreement gives a large margin for white-straw cropping. There was another point in it which rather troubled me, and that was the privilege of selling off, not only stock, but straw, hay, and roots. I consulted some of my friends on that point, and they all agreed that it was a bad rule to allow it—that there might be occasions, and that there were many such in the neighbourhood of large towns, where it might be possible to allow the privilege, and where men could bring back manure. But generally if a man keeps a sufficient quantity of stock upon his farm, and winters them well, he will require nearly the whole of his straw. There was also the important question of remuneration, which I think will be found ample. For all those improvements which are permanent, such as the investment of money in measures or artificial food, I have allowed a very considerable sum. I quite agree with Mr. Chawner that permanent improvements, such as draining, ought to be done by the landlord. It is better he should do them; but provided he does not, and the tenant does, then he is to be allowed a very large compensation. I forget exactly what it is, but it is very considerable. It is taken on a per-centage of his farm, and supposing he used ten per cent. he would have a higher return in proportion than a tenant who used less; and the man who uses twenty per cent. more than the man who uses ten. There are other important points, but they slip my memory. However, they have been treated in the same liberal and practical spirit. I have endeavoured to place both parties in a fair position, my wish being to do that which was perfectly just between the owner and the occupier. Mr. May then assured the meeting that from the first he had done nothing in an underhand manner, and although he had been nominated to serve on the sub-committee, he had from the first made up his mind to send in an agreement in preference. No one read his agreement after it was written, no one knew the motto by which it was signed, and he absolutely posted it at Birmingham, in order that it might not have the Elford post mark. Perhaps the best plan for the person to adopt who felt aggrieved would be to print his own agreement, and then the great public committee would sit upon it. If it was a better agreement than his own they would say so. I have never been so vain, said Mr. May, as to suppose that my agreement could not be improved, and there I think Mr. Chawner was a little extravagant in what he said. If any other agreement or any portions of other agreements can be added or substituted, I think it would be advisable.—(The CHAIRMAN: With the consent of the writers.)—Yes, because after all the object is not to gain £50. £50 is £50, but a good agreement is better than £50, and what you want is a good agreement. I forgot to mention that the notice is a twelvemonth's notice; and if the competition leads to no other change than that, I think the trouble will not have been thrown away.

The CHAIRMAN: If you have an annual agreement that will make it a two years' lease.

A THANKSGIVING.

[The following letter has been addressed to Mr. Shaw, the Secretary of the Royal Agricultural Benevolent Institution. Mr. Tower is well known as "the Father of the Smithfield Club."]

Weld Hall, near Brentwood, Essex,
Oct. 3rd, 1863.

SIR,—You will find my name as a donor of five guineas to the Royal Agricultural Benevolent Institution last year, and I now enclose my cheque for twenty-five guineas more to be added to that donation list, from me. I avail myself of the active exertions now going on to bear testimony by every expression of thankfulness to the Gracious Giver of all Good for the abundant and well-secured harvest with which we have been blessed; and among the various

schemes adopted, it has occurred to me, as I hope it has to many others, that to promote subscriptions to the above Society, of which you are the secretary, has a fair claim to some consideration from its immediate connection with success or failure in that occupation of human in-

dustry. I shall be obliged to you to send me by book-post a few copies of the Rules and Regulations and list of subscribers, for circulation in this parish and neighbourhood.

I am sir, your obedient servant,
To Charles Shaw, Esq. C. T. TOWER.

THE ROOT CROP.

At the Brackley Society's Meeting, Mr. J. L. Stratton, the Chairman, in proposing the Charter toast, said—The foundation of all good farming was good ploughing, and if the Brackley farmers could only compete when the county society held a meeting in the neighbourhood, their competition would be limited to once in about every four years. That being the case, the founders of the Brackley society considered that they ought to do all in their power to endeavour to get farmers to improve their root crops, and to show them some good ploughing year by year. It was impossible, he thought, for any one to travel over England, either by rail, or by hunting, or shooting, without observing that during the past few years an enormous improvement had taken place in agriculture, whether as regarded the root crops or the stock which farmers now kept upon their land. Undoubtedly there had been a great improvement, but he did not think that it was entirely due to the various agricultural societies that had sprung up all over the land. He considered that it was mainly owing to the superior intelligence of the farmers of the present day. They all knew that a good animal produced more than a bad one, and the farmers were now aware that it was a more profitable investment to spend their money in order that they might get good crops, than not to spend it and have bad ones. They had had some bad seasons and some good seasons. They had now had a capital season for the yield of corn upon almost all lands, yet he imagined those who had farmed their land well would have a greater number of quarters per acre than those who had not farmed well, but who trusted a great deal to chance. Although a great deal of the improvement in farming was to be traced to the intelligence of the farmers, they must give some credit to the various agricultural societies that had sprung up in almost all parts of the country. The prizes that were offered for root crops were doing a great deal of good in improving that branch of agriculture. Farmers did not think much of the actual value of the prizes, but what actuated them was endeavouring to beat their neighbours, who perhaps farmed better land than they did. They all knew that some of the land around Brackley was well adapted for growing root crops, whilst some was quite the reverse. The society's champion prize, for the best crop of roots, had been won by Mr. Malins, and he thought his land might be taken as a good average specimen of the land in the district. It was a good land, yet not so good as some, but a great deal better than that which some of his neighbours farmed. Mr. Malins had shown how well he farmed his land by beating those who had better land than himself. It had been said that it depends a great deal upon a farmer having a good root crop to show that agriculture was paying him. That, however, he denied. It was impossible for a farmer to say what was a paying crop of turnips. He might lay out a large sum of money in doing his land well, and he certainly would not see a return of his money in his root crop, but he would make his money by having four good crops in succession. Therefore, if a man laid out £6 in artificial manure upon land intended for roots, it was impossible to say it was not a paying crop; it would not pay the first year, but it would in the three following years. He should be sorry to hear it said, that "So and so has a good root crop, but he has got it at such an expense that it won't pay him." It was impossible to say how the other crops would pay, and it was only after four years that a farmer would be able to say whether the money he had laid out on his land in artificial manure had been paid back again by the improved value of his crops."

The Rev. H. W. SMITH said he was glad that Mr. Malins

had been the most successful cultivator, because he had adopted his (Mr. Smith's) brother's plan, and had ploughed his land two feet deep. That, he believed, was the secret of his success. He (the speaker) had had a piece of ground dug three feet deep, and had sown some parsnips in it. He had exhibited some of the parsnips in the show that day, but unfortunately they had not taken a prize, because it was alleged they were too big. One of the gardeners had said they were "horribly big." Why they were as big as his (the speaker's) leg, in fact they were more than three feet in length, and they had been grown without any manure whatever. He proposed Mr. Malin's health in connection with the successful competitors, because he ploughed his land 22 inches deep, and because a gentleman had informed him that he could push the whole length of his walking stick into his land. Mr. Smith then alluded to the success he had achieved in consequence of his having planted some potatoes upon land that had been ploughed 22 inches deep.

Mr. W. K. MALINS said he was perfectly aware that he had grown a good crop of roots, yet he did not expect for a single moment that the decision of the judges would be what it was. In the judges having awarded the piece of plate to him a great principle was involved. The fact was, that the land that had grown the crop that had carried off the prize had not received a particle of artificial manure. Nothing had been put on it with the exception of about nine to twelve loads of long green manure. It had only one ploughing, one Rental, two horsehoeings, and two handhoeings, the latter at 6s. 6d. per acre. The whole secret of the thing, he considered, was in getting a firm, warm bottom for the roots. During the last seven years he did not think the land had cost him 7s. for artificial manures. Three years ago he had the honour of coming in second, and then he exhibited the whole of his crop, 82 scores. The prize was then carried off by Lord Southampton; and tenant farmers, when they had weight and blood against them, must expect to suffer. He was prepared to state, on oath if it were required, that on that occasion one-third of the land produced the crop without manure of any kind. Many persons present had been over the land, and he should be glad to show it to anyone who would call upon him. Instead of a person being able to thrust a stick into it, it was impossible to do so without recourse being had to a crowbar, and he would defy any man to plough it without a boy sitting on the bottom of the beam. He considered that all his success was attributable to his system, which consisted of planting the turnips upon a stale furrow, seeing that it was solid, and that the land was perfectly clean. He considered it was an honour to win the piece of plate, as he had been successful by adhering to ordinary farm management. He had not robbed ten acres in order to benefit five acres adjoining. Of course it was all very well to know what land would do and what manure would do, but they wanted to know how to obtain the greatest result at the least expense. They knew that the general course adopted in growing turnips was to spend £2 or £3 per acre in artificial manure. He had saved that expense, and had beaten those who had used artificial manure. Therefore it was as clear as possible that the value of the crop did not depend upon artificial manure. Looking at the area which the society embraces—eight miles—they must all admit that it contained land very much superior to his which had produced that crop, and therefore there must be a great deal in the system which he had submitted to them.

NORTH WALSHAM AGRICULTURAL SOCIETY.

This society celebrated its anniversary on Friday, Oct. 9, under tolerably auspicious circumstances, although at one period of the day the rain fell heavily. The meeting is only of a district character, but still it represents the rich hundreds of Tunstead and Happing, which turn out as much tried horse-flesh and sleek cattle as any other part of Norfolk, while in abundant and excellent cereals and heavy root crops they are probably superior to any other part of the county. There was a fair show of useful agricultural stock. The cart mares shown were good, but the cart geldings were not equally commendable; the prize cart foals were much admired, and the class generally was highly commended. The society's premium of £4 for the best cart stallion above four years of age, went to Royal Duke, a six-year-old, standing 16 hands 3 inches, and bred by Mr. J. Skinner, of Tunstall. The premium of £2 offered by the Society for the best cart stallion under four years of age, was awarded to Marquis, a two-year-old, bred by the exhibitor, Mr. J. N. Waite. Royal Duke, it should have been stated, was exhibited by Mr. C. Barber. Mr. J. N. Waite, jun., carried off the £3 premium offered for the best cart mare with Scot, a seven years old animal, bred by the late Mr. Crosse, of One House, Stowmarket. The second prize of £2 went to a five-year-old bred by the exhibitor, Mr. Beare, and in constant work. A grass-fed four-year-old bred by the exhibitor, Mr. H. R. Culley, was highly commended. The £2 premium offered for the best three years old cart filly was won by Mr. Ash Rudd (who had only one opponent), and the same exhibitor was successful in the two years old filly class, besides being awarded Mr. Mott's premium of £1 for the best cart gelding of three years old or upwards; all these animals were of Mr. Rudd's own breeding. The first prize of £1 10s. offered for cart foals was won by Mr. Rising, and the second by Mr. Ash Rudd; the class, as previously observed, was generally a hopeful and promising one. Of late years efforts have been made to stimulate the breeding of hackneys, and with this object Lord Suffield offered a premium of £5 for the best hackney not less than four or more than eight years old. This liberal and timely offer provoked several good entries, and the prize was won by Mr. G. Ives, with a mare six years old bred by himself. A five years old unbroken black mare bred by the exhibitor, Mr. W. Deyns, was highly commended. A prize of £2 for the best hackney brood mare unfortunately produced no entries. Several hackney foals were, however, entered, and the prize of £1 offered was won by Mr. J. Wortley. The Society also gave a premium for the best horse or mare for harness purposes not under three or more than eight years old; Mr. M. Neave proved the winner with a seven-year-old, nurtured of late on dry food. It will be observed that nearly all the prize animals were bred in the district, and by the exhibitors—a circumstance which, if it perhaps detracted somewhat from the brilliancy of the specimens on view, at any rate, gave them a practical and *bonâ fide* character.

So much for the horse stock. In the cattle classes the £4 premium for the best bull of any breed went to Mr. W. L. Jex Blake for a sturdy well-shaped three-year-old Shorthorn by Alma out of Rosabella, and bred by the exhibitor. In the yearling bull class a premium of £1 10s., given by Mr. Dolphin, was won—without however any competition—by Mr. R. Barcham with an animal one-and-a-half years old, bred by Lord Suffield. There was an interesting class of horned cows, Devons excluded, three prizes being offered, viz., £3 and £2 by the Society, and £1 10s. by Mr. W. L. Jex Blake. The first premium was won by Mr. J. A. Storey with a nice roan Shorthorn, 7 years old, bred by himself; the second by Mr.

W. L. Jex Blake with a Shorthorn, 5 years old, bred by Mr. H. K. Tompson; and the third by Mr. J. A. Storey with a white Shorthorn, 7 years old, bred by himself. An entry by Mr. R. Wortley, and another roan Shorthorn shown by Mr. Storey, were highly commended. In polled cows Mr. W. Smith took the prize of £3, Mr. R. Ducker being highly commended. There were three handsome specimens of the beautiful Devon breed of cows shown, all from the stock of Mr. J. Blomfield, of Warham (somehow or other this attractive race does not seem to make progress in Norfolk); the prize of £3 went to Mr. J. Wortley. In horned or polled heifers a calf or in milk, above 2 but under 3 years old, the premium of £2 went to Mr. T. Dolphin, with a two-year-old by Zeta out Cherrytree (bred by the exhibitor and grass-fed). Mr. R. Barcham's entry was highly commended, and that of Mr. T. H. Wells commended. In yearling heifers the prize of £1 went to Mr. R. Wortley, and a pen of three calves, bred by Mr. T. Dolphin, weaned within 14 days and under nine months old, received the premium of £1 10s., no competition being excited in the class. This was not the case with fat steers, the Tunstead and Flapping hundreds generally contributing one or two fine animals of this class to the Baker-street show; this year will probably prove no exception to the rule, some well-developed and well-covered specimens being ready as usual. There were two classes, the first of animals bred by the exhibitors, and the second of animals simply grazed by them. In the first case the society offered premiums of £5 and £3, and the largest sum was awarded to Mr. R. Wortley for an animal 2 years and 5 months old, the second going to Mr. J. Wortley for a Devon 2 years and 6 months old. In the second class Mr. R. Wortley took both the first and second prizes of £3 and £2. Both these classes were highly commended by the judges. The catalogue was sadly deficient in details respecting perhaps the most interesting feature of the meeting. There was also a fat steer class, for animals under 3 years old; the prize went to Mr. W. Primrose, jun., for an animal 2 years old last July, bred by Lord Suffield, a red and white entry by Mr. R. Ducker being highly commended. In fat heifers under 3 years old the prize of £1 10s. was taken by Mr. W. Smith without opposition, with an entry bred by the Hon. Admiral Wodehouse. A prize of £1, given by Mr. R. Wortley for the best ox steer for winter grazing, was won with a steer shown by Mr. W. Deyns. The sheep classes were weak, but a good pen of ten hoggets was shown by Mr. Utting, and carried off the first prize of £2, the second of £1 going to Mr. Rising; the pen of Mr. E. Peters was also highly commended. In the fat shearing class Mr. E. Ling, who was quite unsupported, took both prizes of £2 and £1. The show of pigs was better. Mr. J. B. Perritt and Mr. T. H. Wells took the first and second prizes in boars; Mr. T. Dolphin was awarded both first and second prizes in breeding sows (one of the Starn breed forming one of his entries). Mr. Dolphin also took the prize for the best litter of pigs on the sow. The first prize of £1 10s. offered for the best pen of six pigs under 6 months old being of the same litter and bred by the exhibitor was won by Mr. M. Neave, the second prize of £1 going to Mr. T. Dolphin. In fat pigs a prize of £1, offered by Mr. M. Neave, was won by Mr. C. Barber. The past season has not been a favourable one for the growth of roots; nevertheless, some fair specimens were exhibited. The prize of £1 10s., for the best crop of mangold wurzel (not less than two acres), was won by Mr. W. Cubitt, the second prize of £1 going to Mr. Barcham. Similar prizes for the best crop of Swedish turnips, not less than five acres, were awarded, the first to Mr. G. Ives, and the second to Mr. W. Poole. A premium of £3, offered by Sir T. F. Buxton, for the best root crop occupying not less than 100 acres, taking into consideration quality of the soil and cultivation, was won by Mr. E. Ling; a second prize, of £2, offered by the Society, was awarded to Mr. R. Barcham. The premium of £1 for the best coomb of red wheat was won by Mr. W. Poole; that of £1 10s., for the best coomb of barley, going to Mr. E. Peters, and a second prize of £1 to Mr. H. Wright. Mr. H. Wright also won the prize of £1 for the three best coombs of oats. There was a good deal of com-

petition in the cereal classes, and some excellent samples were exhibited. It was stipulated that each entry should be taken from a bulk of not less than twenty coombe, grown by the exhibitor, and that the bulk should be dressed equal to the sample. Mr. H. Wright offered a premium of £1 for the best 5 cwt. of trefoil hay, and it was won by Mr. E. Ling; a prize of £1, given by the Society, for the best 5 cwt. of clover going to Mr. J. B. Porritt. It should be added, although the allusion is perhaps rather out of place here, that a brown gelding, exhibited among the extra stock by Mr. O. Buxton, M.P. for Maidstone, and who has property in the neighbourhood, was highly commended. The entries were about fifty in excess of any former year, and the show must have been financially a success. The judges of stock were Mr. C. S. Read, Plumstead; Mr. W. Goulder, Wimbotsham; and Mr. R. Kidman, Repps.

The dinner in the evening was presided over by Lord Suffield. The practical speakers were kept in abeyance by the overflowing oratory from the head table, but it must be admitted that the address of Lord Wodehouse, Mr. Buxton, M.P., and Mr. Howes, M.P., were more interesting and to the point than is customary at such gatherings. Mr. Buxton created some little amusement by his allusion to the excellent crop of barley, and the probability that it would be very cheap—a matter, of course, of some moment

in connection with the production of "Entire." Mr. Buxton then remarked that agricultural improvements were extending in all directions, that the social position of the farmer was also being improved, and that the intelligence of the tenant farmers had risen materially, although he still thought they did not take sufficient interest in the discussion of public affairs, but left them to be controlled too much by the middle classes in the towns. Mr. Howes deprecated the undue self-laudation of the agricultural interest at such gatherings; and addressing himself to the malt tax, said a substitute must be suggested before the Government could be expected to part altogether with £5,000,000 or £6,000,000 of revenue; at the same time, he thought a drawback might be arranged, by which, if it was proved that malt was useful in fattening cattle, farmers might be so far exempted from duty. Lord Wodehouse referred to the necessity of improving labourers' cottages, and taking the subject of the law of settlement gravely in hand. His lordship also called attention to the fact that wages were 1s. per week lower in Norfolk than in other districts, a circumstance which accounted, he thought, for the falling off discernible at the last census in the population. Talk such as this, and allusions to the state of Poland and America, pretty well filled up the evening.

ROYAL VETERINARY COLLEGE.

The lecture, introductory to the session 1868-4, was delivered on Monday, Oct. 5, at the college, by Professor Tuson, who, after a few prefatory remarks, said that there were few, if any, periods of a man's life more critical or important than that at which he chose a pursuit which was ultimately to be the means of obtaining for him the social position of his ambition, and of supporting himself and others who might be dependent upon him. It was, therefore, to be hoped that those present here weighed well the profession which they had resolved to follow before entering into its ranks, for they would not meet with success, in even a moderate degree, unless they were prepared for hard and steady work, and to combat with the many difficulties and disappointments which must necessarily arise. Although he had only three years' experience in the veterinary art, he had seen quite enough to congratulate them on their selection, because veterinary or comparative medicine, if rightly pursued, was excelled by few other occupations in interest and variety; its teachings were often of practical service in the higher calling of human medicine, and their professional duties would enable them to foster one of man's noblest and best qualities—a humane disposition. They were adopting a young and rising profession, in which they would have very great opportunities of distinguishing themselves; for although much had already been accomplished by their predecessors, there was such an abundance of good work to enable the veterinarian and his art to occupy a more exalted status in the estimation of the public. Although not a veterinary surgeon himself, he would point out to them a few of the paths which they ought to take. Firstly, it was necessary that before commencing their profession they should have received a scholastic education, even better than that acquired by the majority of youths of the present day, inasmuch as the study of anatomy, physiology, or other medical subjects was incomparably easier to a pupil who had a knowledge of the classics than to him who was deficient in that respect, having by his previous training learnt how to study. They all knew that the members of the medical and legal professions at the present time held a high position in the social scale, but this was not to be attributed so much to the nature of the duties performed as to the circumstance of its being universally understood that they were men of education. Of late years persons desirous of obtaining commissions in the army as combatant officers have been compelled to pass an examination in subjects of general education. Members of the Royal College of Veterinary Surgeons may compete for and hold commissions as veterinary surgeons in the cavalry and artillery: it is their duty to be as well educated as the other officers with whom they associate. Having at considerable length endeavoured to impress upon the students the necessity of a sound scholastic education, he proceeded to state that it was advisable, before attempting to

pay attention to strictly medical and surgical studies, that they should gain a general acquaintance with the natural and experimental sciences, viz. zoology, botany, natural philosophy, and chemistry; the immediate advantage of which would be that when they came to apply themselves to purely professional subjects, their preliminary knowledge would form a strong foundation upon which the superstructure could be easily erected. The veterinary surgeon who had received a general and scientific education would have an opportunity of gaining a more thorough knowledge of his art, would exercise his calling with greater skill, and would be much more likely to contribute towards the advancement of his profession. With regard to chemistry, he would say, with Sir Humphrey Davy, "Its beginning is pleasure; its progress, knowledge; and its object, truth and utility." He then proceeded to explain the origin and progress of chemistry, and said that to the alchemists the world was indebted for the discovery of common mineral acids, salom, corrosive sublimate, and many other important medical agents. The science was now one of the most important departments of human knowledge, and there were very few pursuits which had not been benefited by it. It was especially useful in the many departments of medical knowledge with which they would have to acquaint themselves; and the information revealed by anatomy, which teaches us the shape, structure, and relative positions of the organs of an animal, would be incomplete unless we knew of what they were each chemically composed. It was, however, that most interesting study, physiology, which acquainted them with the duties performed by the various organs whilst in a state of health, to which chemistry had rendered special service, as without it the physiologists would have possessed very little knowledge of the process of digestion, respiration, &c., and the composition of, and changes of composition undergone in the body by the different kinds of food, of the saliva, gastric juice, bile, blood, &c. In confirmation of these statements, he quoted some of the remarks contained in the address delivered last year by the professor of pathology at the University College, London. Pathology had been much advanced by the borrowed light of chemical science, and the majority of physicians were now so perfectly conversant with that fact that they daily employed the test tube as an aid to diagnosis, and to assist them in devising a rational mode of treating the diseases of the patients committed to their care. Having referred to toxicological chemistry, as being worthy of greater attention than many of their predecessors had devoted to it, as there was still much room for investigation amongst the poisons of vegetable origin, he concluded by calling the attention of the students to the extensive alterations and improvements which had lately been carried out in the college, and the benefits which would result therefrom.

PETERBOROUGH AGRICULTURAL SOCIETY.

The Peterborough Agricultural Society held its twenty-sixth anniversary on Wednesday, Oct. 7. Here is another society, in a district capable of much better things, supported very well by the landowners and very shabbily by the farmers. The same old standard sum of 10s. is to be seen attached to the names of nearly all the members, and I am at a loss to imagine upon what principle they all agree to feel only ten shillings' worth of interest in so good an undertaking. Signs of an awakening here, too, as well as at Newmarket, occurred this evening, and it was considered that the members might be doubled (I should say the subscriptions too) by an energetic canvass of the town and neighbourhood.

The society receives and disburses about £190 annually. About £50 is distributed in prizes for hedging, draining, and ploughing, and the remainder in prizes for stock. The competition for the manual labour and ploughing prizes occurred at some little distance from Peterborough. There were about thirty plough-teams, and in the champion class, which contained Messrs. Howard, Ransome, and Downes, the Howards took the honours by their man Purcell, who started indifferently, but soon mended, and made a splendid finish. Messrs. Ransome's man made a good beginning, but by a little too much management spoiled what was a good chance of winning. As he neared the furrow he made his work a little too deep, and slightly dished the land. The ploughing in general was admirably done. Messrs. Amies and Barford had a set of Fowler's small tackle with disc anchor windlass in operation near the plough-teams. The work was greatly approved.

The show of stock was far inferior to what I expected to see. The sheep, of which there were nothing but Lincolns, were very fine in quality though few in number; but as far as the horned stock is concerned it was completely redeemed by the entries of one breeder, Mr. William Sissman, of Buckworth, who competed in nearly every class, and as generally carried off the first or second prize in each. He is not an extensive farmer; and has only very poor buildings, but he certainly produces some of the best stock I have seen. He is using Paul Pry by the Great Mogul, and Doctor by Abelard, — by King Arthur, by Crown Prince; all Booth blood, if I must adhere to the absurd classification of Booth and Bates. He also has Bates' blood, as will be seen. It would not be fair to say Mr. Sissman's were the only good stock, for there was a beautiful red and white ox bred and exhibited by the Earl Spencer, perfect in form and feeding. Mr. James Mayfield showed two monster red oxen, the smaller of which was the best in every respect. Mr. Sissman's a rather small roan two and-a-half years old ox, took the second prize, with touch and hair admirable. In the Bull Class, Mr. Sissman was again successful with a fleshy, square, well-formed red and white yearling, Sir Edward, by Booth Sir James, dam Duchess of Gloucester. The head was wanting in grandeur, and that was about the only fault; the hair and touch, as before, admirable. The second prize was awarded to the Hon. G. W. Fitzwilliam's not by any means fine roan yearling, and Mr. Whitwell, who endured a good deal of chaff at the dinner for going to shorthorn sales, and paying high prices for "blood" irrespective of form, certainly did exhibit a bull purchased under such circumstances, which displayed a wonderful head of hair. Mr. Robert Searson entered a good breeding animal in this class, as he did in several of the others. Mr. Sissman showed three cows,

and took the first and fourth prizes, Mr. Searson carrying off the second and third. Mr. Sissman's first was by Abelard, small but pretty, with an unexceptionable touch. Mr. Whiting was successful with in-calf heifers under 3 years; both prizes were awarded to her. The prettiest and most remarkable animal in the yard was found amongst the three competing yearling heifers—Mr. Sissman's Belle of Buckworth, by Royal Butterfly the 5th, dam Keepsake by the Great Mogul, a heifer without a fault. Nothing could be more beautiful—the Butterfly dignity and the Booth substance. Surely she will add celebrity to the Royal, some day. The second prize was taken by Mr. Griffin's yearling. This completes the list, thirty-two animals in all—altogether disreputable for Peterboro'.

The horses of the neighbourhood are celebrated for a fine roomy stamp; and the London brewers' stables are supplied to a great degree from this source. Of the stock horses there were six entries, Mr. Jos. Seaton's and Mr. Taylor's taking first and second prizes, the latter being of the famous England's Glory breed. Of cart geldings, fillies, and cart mares with foal at foot, there were eight entries, the prize in the first class being awarded to Mr. H. Cook; to Mr. Edward Faux in the second; and to Mr. John Griffin and Mr. Henry Cook in the third, the first of the third class being a substantial grey mare, and the second a prime old roomy mare of square type; the term *roomy* being defined by a gentleman who spoke at the dinner to mean a mare that would give a comfortable seat for four or five people on her back.

A good deal of interest was excited by the entries for prizes offered by the Hon. G. W. Fitzwilliam, by the Hon. F. H. Vernon, and by Mr. S. Middleton, for the best four-year-old gelding or filly for hunting purposes. A great showy bay horse, with a springy gallop, by Prime Minister, bred by Mr. C. W. Griffin, gained the first prize; the second was awarded to a well-handled chestnut horse, good, but decidedly inferior to the first. Mr. Sissman showed a very fine chestnut mare by Pollard. In the next class, in which five yearling colts or filly hunters competed for £10 offered by the Hon. C. W. Fitzwilliam (the third son of the late Earl), Mr. William Sissman took the prize with a black colt in fine condition and good mould, by Vortex, out of the above mare; and he showed another, which was highly commended. The challenge cup offered by the Hon. C. W. Fitzwilliam was gained this year by himself, his hunting mare, with foal at foot, by a thorough-bred stallion, being the only entry. The mare, a fine brown animal with a bay foal by Musketeer, fully deserved the honour, and thus the cup which was Mr. Sissman's last winner, returns to Peterborough, and it is now to be seen whether the present holder can give it a permanent place on his sideboard by winning two years more in succession.

The sheep prizes were obtained by Messrs. Bellars, James Webster, John Moore, Samuel Vergette, and John Griffin, Mr. Vergett's surpassing the rest in general merit. The show was good, but small for the district. Why not throw the prizes open for general competition, instead of confining them to a radius of fifteen miles of Peterborough? For pigs, the Hon. C. W. Fitzwilliam's, Mr. William Pawlett's, and Mr. Deacon's gained prizes: Mr. Pawlett gaining a first and second.

There was a small show of implements: Messrs. Amies and Barford took the prize for the best exhibition of

machinery for tillage and other purposes; Thomas Hays and Sons, Chapman of Apethorpe, and James Coultas also exhibited.

The dinner was set out in the large room of the Wentworth Hotel. About 90 gentlemen discussed the viands, which were well put on and served. The Hon. G. W. FITZWILLIAM presided; supported by the Hon. C. W. Fitzwilliam, the Hon. F. H. Vernon, Mr. Wells, Mr. Mein, agent to the Duke of Bedford, and several other gentlemen. As the chairman's speech may appear in another place it is not necessary that I should give it here. He was followed by Mr. Mein, who made some most pertinent remarks upon agricultural progress, embracing labourers' cottages and steam cultivation. With regard to labourers' cottages, he was of opinion that the erection of them was clearly a landlord's question, and implied that if all landlords had given it as much attention as his Grace of Bedford, little need would now exist to promote reform. No civilizing agencies now in operation could produce much effect if this were omitted. If the dwellings of the labourers were left as they were, in most cases fit only for the brutes, what could be expected but a brutal state of society amongst those who occupied them? He urged upon landowners the duty of building good, roomy, substantial cottages, containing a sufficient number of sleeping apartments, with stout sound-absorbing partitions between them, and letting these at low rents, considering that it was best to sacrifice somewhat in favour of a respectable class of labourers, than to gain by a set of worthless characters, who only increased the poor's-rates and county charges. He referred to the prizes offered by the Society of Arts, and stated that their price was too low; nothing good could be built under £120, an estimate which a following speaker thought too much by £40, since he had known many good cottages built with 9-inch partition walls for £80 each. No mention was made to the law of settlement as the foundation of the evil. Mr. Mein then went on to extol the benefits to be derived from the steam tillage of the heavy lands of this country. He mentioned the perfect finish put by the steam-driven tine or share to the work of the

drainer, and spoke of the increased produce which is sure to follow upon thus creating a deep dry seed-bed at the right time of year; he said a few words with regard to the aid the General Steam Cultivation Company is likely to render to those farmers who stand in need of increased capital; and referred to the presence of the secretary (Mr. Howard Reed), who, being subsequently called upon by the chairman to explain its objects, began by stating that several landowners and others of distinction, having witnessed the bar to the spread of steam cultivation, which was to be found in the lack of capital, mentioned by Mr. Mein, considered that a large fund might be raised for the purpose of supplying farmers with any set of apparatus they might require, they being allowed to repay the principal, with interest, by easy annual instalments extending over a specified number of years. The landowners had their companies for enabling them to carry on landed improvements, either in building or draining; and why should not the farmers have a fund to which they might apply when help was necessary on any great emergency, such as the purchase of a set of steam-plough tackle? The interest charged would not exceed 6½ per cent. The applicant could pay this, as well as the principal, in three years at most, out of the extra return which improved culture would assure him; while the shareholder might rest satisfied of receiving a handsome dividend, since so small a part of the profits would be absorbed by the small staff required to manage the concern. Mr. Wells made some very pertinent remarks on the management of agricultural steam engines, and offered a prize of £10 as a reward to circumspect engine-drivers. This proposal aroused a good deal of discussion, and while it was thought well to adopt this course, it was thought highly necessary by Mr. Mein and Mr. Barford to register the steam engines of the district, and appoint a suitable man as surveyor, whose duty it should be to inspect all engines quarterly, and report upon the state of such. It is probable that the Society will take this affair in hand, and that one of the benefits of the members will be that of having their boilers periodically tested as to the pressure they will bear.

KETTERING AGRICULTURAL SOCIETY.

This is one of the most prosperous and vigorous of all our local societies. One reason is, perhaps, that it has less of the local character than most others. Its prizes are thrown open to competitors from any of the English counties; the consequence is that the standard of excellence is raised, and that a greatly-increased interest attaches to the annual displays of skill, or of stock, over those cases where it is competent only for those to compete who reside within ten or fifteen miles of the town where the shows are held. There is nothing like a free and bold spirit in the management of these societies. The confining, and what may be called protectionist, spirit breeds its own kind: "What we sow, that shall we also reap."

The Kettering Society has, it is true, a fine *role* of patrons, consisting of Dukes, Marquises, Earls, and Baronets; but at the same time the farmers of Northamptonshire do not allow them to maintain it, for I find that some 600 of them come forward and subscribe £1 each annually to its funds. In addition, I see £164 put down annually as donations. Of this sum some £200 are distributed in prizes to be competed for by the labourers for length of servitude, skill as shepherds, as ploughmen, hedge-cutters, and drainers; and the remainder by exhibitors of live stock, implements, and poultry.

The show of stock occurred earlier in the year. On Friday, Oct. 9, the men met in friendly rivalry to try for the ploughing, hedging and ditching, draining, and steam-ploughing prizes. The ploughing classes contained nearly 60 entries. The rain poured down in torrents, and made the arena on which the struggle took place a very sea of mud. The work was excellent, however. Of course a great deal of interest centred about the champion class, where Howard, Ransome, and Ball had each a representative; the first-named being successful. Mr. Watts, of Orlingbury, had entered his set of Fowler's tackle, a 14-horse power steam-engine with plough, for the two prizes offered for steam-ploughing and cultivation. No rival appeared, and he won both, working the whole time in the rain without stoppage. There were 29 hedgers and 25 drainers. The work in both cases was admirably executed, especially the latter.

The dinner, held at the George, was well attended, but otherwise a miserable affair. The tables, to accommodate some 70 people, were set out in a small, low, dirty room: the provision was anything but profuse, and so few were the waiters that the loudest voice and the constant exercise of it was necessary to secure any attention. The confusion that ensued consequently can only be imagined.

Under different circumstances, I dare say that the Kettering Society would behave with more dignity; but I must say I was not impressed with any profound respect for it by this Babel display, in which the every-man-for-himself principle banished all vestige of polite behaviour. Mr. George Checkley presided, and Mr. Owen Wallis officiated as vice-chairman. The latter gentleman made a capital speech on the cottage question. He pointed out an abolition of the law of settlement as the only means of bringing about a change in the system of cottage building now in vogue, and showed how at variance the mode of driving the labourers to the towns was, to the dictates of common sense as followed in the colliery districts, where, on the event of a mine being worked, the first thing done is to build cottages near the mouth of the pit, for the people who are to work it. This is an example how self-interest works when left to itself and un-

restricted by law. Mr. Rice, one of the judges of ploughing, made some very sensible remarks about the want of combination for political purposes on the part of the farmer. He suggested the institution of Chambers of Agriculture, both local and central, where agricultural affairs should be discussed; he considered it would be well that the proceedings of the two Houses should be watched, and, if need be, checked, by means of agitation proceeding from the centres. The farmers, as a rule, took no notice of measures while they were being forged round their necks, but began to grumble only after the rivets had been driven home and headed. Let farmers be men! they would lose nothing by speaking out manfully. Mr. Watts made some very pertinent remarks as to the benefits he had derived from steam cultivation, and endeavoured to induce his brother-farmers to follow his example.

NEWMARKET AGRICULTURAL SOCIETY.

The Newmarket Agricultural Society, under the perpetual presidency of His Grace the Duke of Rutland, held its third meeting on Oct. 6. The show of stock was held in a paddock near the Rutland Arms, and the dinner was in the large room of the Golden Lion Inn. This, like so many of the agricultural societies, has but a small position, and were it not for the aristocratic members who support it munificently, and kindly strengthen the hands of Mr. Clarke, its founder and honorary secretary, it would perhaps have scarcely struggled into existence, so slender is the interest taken by the farmers of the district in it. This is not as it should be. In order to succeed well, such societies must depend, not upon the aristocracy, but upon the farmers who are supposed to be in themselves and in their labourers most widely benefited by their wholesome action. A little life did appear to be put into the institution by the speech of Mr. J. H. Adeane, M.P., who twitted the agriculturists of the county with their inability to produce a meeting worthy of the high character of the district. He devoted some minutes to an endeavour to put the matter on a better footing, and his remark will probably lead to this society extending its boundaries, and shifting its shows to different parts of the county. At present the subscriptions are below £100 per annum, and this sum is divided in prizes for the encouragement of labourers, and prizes for the encouragement of stock breeding. The society is certainly doing good to the men and boys who contend for the prizes for ploughing, shepherding, and varied merits of other kinds, but as to stock its effect is *nil*. The prizes are not large enough to induce the farmers to compete, or the farmers are too considerable to become competitors for such small sums. They lack the stimulus of gain, and entertain no regard to their duty to the district. The way to overcome this cause of failure is for the various local societies to maintain their special exertion on behalf of the labourers of their own districts, but to throw the stock prize money together for one good central annual exhibition. If Mr. Adeane's remarks shall have this result, they will have effected much good.

The show of cattle was contemptible; and of course the herd of Lady Pigot, once so formidable in competition here, was much missed. There were a few beasts, a sprinkling of horses, amongst which was one Suffolk of fair pretensions, a capital pen of lambs, and a tolerable show of roots. The implements were confined, I think, to a little three-horse power steam engine, which, in the vacant space, seemed to puff and swell itself out to leviathan proportions. How different might all this be, if only the leading farmers, men of large influence and capital, were to come out of their indifference, and work heartily for so good an ob-

ject. No neighbourhood abounds with better-bred horses, beasts, and sheep, or with better-grown roots and grain; and a little effort only is wanting to make an annual collection of the agricultural *maxima* of produce. Looking down the list of subscribers, I observe the everlasting 10s. against the names of men who should feel a pride in giving in so good a cause, their three or their five guineas.

The ploughing took place on Mr. Ratcliffe's farm, which lies in splendid fields for steam cultivation. It was a piece of light land fixed upon; and after the wheat crop had been removed, the surface had been thinly pared and harrowed about—not as a treatment for couch-grass, I should presume, for there was none, but to induce the annual seeds to chit. There were thirty-four teams on the field, the farmers' sons having ploughed the day before—to hide their blushes. I need not say that the land so previously treated offered none, or scarcely any, test of the abilities of the competitors. The work, it was said, was better done than formerly, but there was nothing deserving of much notice. The majority of ploughs were of Howard's and Ransome's make, and the men seemed to have mastered the art of setting them so as to leave them plenty of time to chatter across to one another while they were passing from one headland to another.

The dinner was certainly worthy of a better show. I never sat down to anything equal to it on any such occasion. As a rule, the annual "feeds" got up by our agricultural societies are vile affairs. They are expensive and bad, and well exemplified by this year's dinner at Lancaster, or that which occurred a month ago at Derby, where, if people were to satiate the claims of hunger, they were fain to rush about in quest of even the very necessities of a meal, let alone the luxuries altogether. The stewards would do well to take a lesson from the admirable mode in which Mr. R. Benyon kindly undertook and admirably carried out this affair. A nice, seasonable, hot dinner, well served, at a reasonable price; the room ample and airy; the guests neither crowded nor hurried, the tables decorated with beautiful flowers; plenty everywhere, and no need for a voice to be lifted upon any waiter, beyond its natural pitch.

The presidency of Lord George Manners, M.P., on this occasion was precisely of the character it should be—affable as a member of the house of Rutland, modest, sensible, business-like, sprightly. Mr. A. H. Adeane, M.P., supported him on one side, and Mr. R. Benyon on the other. Around were the farming magnates of the district, and a trio of sweet singers from the Ely Choir, who shed a breath of refinement and enjoyment over the whole of the proceedings. Lord George made the speech of the evening, a report of which will be found elsewhere.

WHY FARMERS ARE MORE SLOW IN AVAILING THEMSELVES OF INVENTIONS THAN MANUFACTURERS.—DWELLINGS OF THE LABOURERS.

At the Wayland Society's Show, Mr. BRAMPTON GURDON, M.P., remarked—"I know it is often said, I think superficially, that we as a body are more slow in taking advantage of any new invention than the manufacturers are. There may be some truth in this; but we must recollect that any new experiment among the manufacturers is taken up by a very wealthy class—the master manufacturers—while, on the other hand, in the case of any agricultural improvement, if it is necessary that there should be any great outlay upon it, it has, in the first place, to be taken up by some enterprising large proprietor, like my noble friend here; but that does not make it a practical improvement, and it only becomes so when the tenant farmer, feeling assured that it will pay him, takes it up as a matter of business. He, however, is naturally more slow about it than the manufacturer, because it does not hold out to him the prospect of those immediate gains which a new invention generally gives to the manufacturer. We must also bear in mind another thing, namely, that the farmer does not make a large fortune by a single lucky hit, and that he is always obliged to recollect another thing, and that is the great distinction between fancy farming and practical husbandry. Therefore he is naturally a little more slow than the manufacturer. Still, I have not the slightest doubt that agriculture is progressing, and that, stimulated by societies like this, it will continue to progress. Indeed, I think that in due course of time we shall find that an undrained field is a rare sight, that larger fields will be surrounded by smaller fences, and that much of the labour now done by hand or by horse labour will be performed by mechanical means. But all this must take time, and I do not think we need be too much in a hurry about it, for we may not yet have seen the machines that will ultimately be adopted. You may depend upon it, however, that it is only a question of time. It is a subject that we cannot avoid; it will be forced upon us, and, perhaps, those will be the wisest who take advantage of having observed what has passed in other branches of industry—who will take warning in time that they may not be left behind in the race. I do not know that anything is more calculated to prevent your being left behind in the race than supporting such societies as this, and attending meetings of this kind, where we all gain some information, some wrinkle, that we had not before. Another thing, also, is that we are enabled to get out of some prejudice that we all more or less cling to."

Lord WALSHINGHAM said—They lived in the days of associations. It was the habit of friends and neighbours to associate together for various purposes, and a very excellent habit it was. He thought it in some degree answered the observations of his hon. friend on his right (Mr. Bontineck), when they saw how many could combine and associate for any purpose which they thought was for their common interest and the general good. No doubt it was an immense advantage to tenant farmers as well as to the owners of land, that good stock should be kept upon the land, and he thought they would all agree with him, that this year there had been a very marked improvement in the character and quality of the stock that had been exhibited, in addition to which, there was a greatly increased number of entries. He had not exhibited, because he had been somewhat fortunate elsewhere, and his object was not to compete with those around him; but to see how they could get the best specimens together of that which the neighbourhood really produced. There was one animal shown to-day which he would mention as *facile princeps*. As he thought the very best animal in the place was Mr. Matthews' cow. He did not know when he had seen so beautiful an animal—an animal so perfect in shape, so admirable in her fore-quarters, so fine in the bone, and so beautiful in the skin and flesh. As he had the honour this year of being president of the Smithfield Club, he must invite Mr. Matthews to show that animal at the Smithfield show. It was not in his power to promise Mr. Matthews a prize, but he thought he might

safely say that Mr. Matthews must stand in a very good position, and would have a very fair chance. He knew he owed a great deal of the kindness he received here to the fact that he had tended in some degree to keep up the reputation of this county for its stock, and he thought it would be unfair in him not to say that very little of the merit was owing to himself, but it was rather owing to one who had acted with the greatest energy and the greatest spirit, Mr. Woods, whom they all knew carried out his views and wishes, and had brought his stock to a degree of perfection which he (Lord Walsingham) had never expected he should attain when he first began. Perhaps his (the President's) hobby had been an idea which he had always entertained, that the cultivation of the land, and particularly of the lighter lands in the neighbourhood, was capable of much greater development than it had hitherto received even at the hands of the most talented and clever of the farmers in the neighbourhood. If he had done anything which had a tendency to prove he had not made a mistake in this he should be very much gratified. But he knew that he had a great deal still to do in the same line, and that it did take a very great deal of time and attention to bring out all the qualities the land really possessed. He thought they would all allow that he had never been what they would call a speculative farmer; that he had never encouraged extravagance or speculation in farming in any degree. What he had done he had steadily done and he had taken time about it, and he trusted that he had been in that line, which he called his own line, tolerably successful. Before sitting down there was one subject on which he should like to say a few words; because it was a subject that had been brought before the public very much of late. He alluded to the subject of the dwellings of the labouring classes. This subject appeared to have been taken up in the first instance by the public prints, and he had been surprised to find how very much blame seemed to be thrown on the landlords and others for not having done their duty in this respect. Now, he would say that, so far as he knew anything of what had been going on on landed properties in this country, that there was no subject that had received so much and such careful attention as this very subject of the dwellings of the labouring classes. It had been taken up in various ways, and the Royal Agricultural Society had given prizes for model agricultural cottages. In fact a great deal of pains had been taken upon this subject. He did not like to speak of himself, although he was always building cottages; yet sometimes he really found a difficulty in filling them with the sort of men he wished to have. He knew perfectly well that instances might be shown in which there were a great number of persons too many contained in a cottage, and where persons were not decently and properly lodged. No doubt the beginning of all this was the law of settlement; but the law of settlement had been relaxed. People who built good cottages were anxious to find good men, but let them go into some of the rookeries that were talked of, and they would not find in the number of people in those rookeries one man who would do the work that was wanted to be done on the land—that was intended to be done on the farm. He had at this moment a cottage to let, and he was sorry to say that although there was a great number of labourers in his neighbourhood well housed, there were others lying unfortunately too thick, but whom he could not move out of the places where they were into a good cottage, because he knew that he could not depend upon them to do the work he should expect of them if they were so placed. This was in a great measure an answer to a very great deal that had been said on this subject. He was happy to say that a very sensible letter appeared in the *Times* which placed the matter on a right footing, and with the exception of one thing, which he would first allude to, he entirely agreed with it. It showed most clearly that the origin of the evil was the law of settlement. It admitted that there had been a great relaxation, which had done a great deal of good; but the writer of the

article thought the evil would be got rid of by the adoption of a union settlement instead of a parochial settlement. Now, there was no more reason why a man should be removed from one union to another than from one parish to another; and unless the law of settlement were abolished altogether, so that a man must be relieved in the place where his distress and necessities arose, no good would be done. It was of no good for people to go to Lancashire, if whenever there was distress there those people were liable to be sent back. If a man were to go out where he was wanted, it followed as a natural law of supply and demand that if he were thus interfered with by means of the law, that man had a great evil done to him, as well as the proprietor of the estate to which the man was sent back, and those who were being employed on the

estate and with whom he came in competition. He had only referred to this matter which had appeared very much of late in the public papers, in order that he might set himself right upon it, and state what his opinion was. The subject was one that he had for a very long time turned his attention to, and he had no doubt whatever about the real bearings of the question. He trusted that they would see the law of settlement very materially relaxed, but he did not think that persons had a right to blame the landlords for there being some things which the landlords wished to do away with. As a rule he must say that the landlords had paid the strictest possible attention to this subject, and there was no point in the improvement of the condition of the people which had received more attention than this very point—their dwellings.

REVIEW OF AGRICULTURAL MATTERS.

At the Hertfordshire Society's meeting, Sir E. B. LYTON said: Providence has blessed us this year with an abundant harvest; and in that blessing to the farmer it is, perhaps, not sufficiently considered how great is the benefit bestowed upon the other sources of national wealth which give life and activity to other branches of our national industry; for although a nation, in its domestic relations and interchanges, is divided into various classes, forming various callings and occupations, yet, in the dealings with the foreigner, a nation must be considered as a single customer; and in those circumstances in which we produce the main staple of food for our population so abundantly as to cause a sensible diminution in the outlay of money devoted to the purchase of foreign corn, it is clear that there must be a corresponding saving—that is to say, a corresponding gain to the national moneyed capital, which again seeks for reproductive channels in stimulating the industry of the manufacturer, the merchant, and the trader, so that the whole community participates in the richness which rewards the labours of the farmer. Now, it is a very cheering sign for our future prospects that the abundant yield of the corn crops this year is not owing exclusively or solely to the favourable season, because we find that on looking back to any former year in which the weather and the season were equally propitious, still the result of this year exceeds the produce of any former year under circumstances equally favourable. And we are assured, by statistical calculators, that, on any average of previous years, taking good and bad seasons impartially, that the fields are now yielding many more bushels of corn per acre than they have done within any comparatively recent period. This is a proof that not to the season alone, but that also to the improved skill of the farmer the nation is indebted, for the increase in the main element of its wealth; and perhaps Professor Liebig is not too sanguine when he says, in the remarkable pamphlet which has just been published, recommending the utilisation of the sewage of towns, that in the continued progress of agricultural improvement in the three kingdoms, England, Ireland, and Scotland will grow corn sufficient to supply the wants of the whole population, without purchasing corn from abroad. I need not detail to you the many causes which have contributed to the progressive increase in the fertility of the soil, such as the more liberal employment of artificial manures, the bolder recourse to improvements in machinery, the more careful selection of seeds, and a better system of rotation of crops. Perhaps I might mention, among the minor causes, some few things in which the landlords may claim some share of the merit; such, for instance, as where they have not only permitted but somewhat encouraged the removal of superfluous hedges—the thinning, when it is neither ornamental nor useful, of hedge-row timber, and the opening the fields to the air. While on this head, perhaps I may be allowed to say that drainage would be much more extensively practised if the stipulations with regard to Government aid were somewhat relaxed, for there really are some soils on which drains four feet deep and so far apart do little or no

good. I am aware that tenant-farmers would be much more eager applicants for drainage, and would much more cheerfully pay a percentage upon the outlay, if the Government—to which, unfortunately, the landlords are often compelled to resort—would take more into consultation the tenant-farmers themselves as to the peculiar requirements of the soils with which they are practically acquainted, and in which they embark their capital. The bounty of the season has been the more opportune, because although the root crops are more promising than they were at the early part of the summer, still, on the whole, they are likely to be much below the average; and that circumstance, together with the very partial nature of the hay crop, which, although good in quality, and even abundant in some parts, is still deficient in others, is likely still more to raise the price of meat and to diminish the quantity of stock which the small farmers may be able to keep through the winter. That brings me to a matter of the most vital importance both to the farmer and to the public at large—I mean the alarming extent to which of late years disease has prevailed amongst all kinds of stock. I may point out more particularly the prevalence of the lung complaint amongst cattle. A very eminent authority at the International Congress of Veterinary Surgeons at Hamburg has given us an account of the mortality of stock in the three kingdoms, and his statement is really most startling, for he computes that in the six years ending 1860 the value of the stock which have perished in Great Britain and Ireland is £24,500,000, while the quantity of stock which has been imported from abroad within the same period is less than £4,500,000; so that the nation has lost within that period four times the value of the stock which has been imported. Professor Gamgee ascribes this great mortality principally to the introduction of foreign stock; and he justly observes that, although he is not desirous of stopping free trade in foreign stock, yet still this amount of disease—for which not the farmer alone, but the consumer is the sufferer, partly because it must tend to increase the price of meat, and next because the consumer is the sufferer from the quality of the diseased meat which he purchases, and the enormous amount of money which is lost—not to the farmer alone, but to the whole nation, has become a matter of paramount and serious importance. Professor Gamgee suggests (and very properly) that all persons who have discovered any effective remedy for that disease should make it known as a great public benefit. Perhaps some one present may be able to give us the result of experiments in inoculation. I may mention, with great deference, a slight experiment which I made at Totteridge. Five cows out of ten were attacked by the lung disease, but I have not had one cow attacked since I tried the experiment of inoculation. Professor Gamgee suggests, as a valuable preservative against milk fever, to which cows are subject, a dose of Epsom salts previous to calving. I know you will pardon me for these heavy and dry details, which I throw out as an inducement to those who are more competent judges than myself to offer hints and suggestions for our general instruction.

BATH AND WEST OF ENGLAND SOCIETY.

The usual monthly meeting of the council of this society was held on Saturday, Oct. 3. In the absence of Earl Fortescue (the president), through indisposition, the chair was taken by the Earl of Portsmouth. There were also present Colonels Acland and Luttrell, Rev. T. Phillpotts, Dr. Gillett, Messrs. Archer, Andrews, Badcock, Bruce, C. Bush, R. H. Bush, Cotterell, Dickinson, T. Danger, Davy, Daw, Drewes, H. Fookes, M. Farrat, J. Fry, John Gray, Jonathan Gray, R. N. Grenville, J. Hooper, H. P. Jones, J. E. Knollys, J. Lush, H. G. Moysey, R. May, S. Pitman, G. S. Poole, W. Porter, J. Siliffant, J. W. Siliffant, W. Thompson, E. U. Vidal, J. W. Walrond, H. Williams, Robertson, Goodwin (editor), &c., &c.

ARTS COMMITTEE.—Mr. Drewe brought up the report of this committee, and on the motion of Mr. H. Williams the sum of £200 was voted for the erection of a second building for the exhibition of works of art manufacture, in lieu of the unsatisfactory annexe hitherto used for the purpose.

STOCK PRIZES.—Mr. Moysey, as Chairman of the Stock Prize List Committee, presented a list of prizes, recommended to be offered at the Bristol Meeting. He said, that as the Society was about to visit a large and influential city, it had been thought advisable to add very materially to the value of the prizes for the various kinds and classes of stock. The increase suggested amounted in all to about £152; but, on the other hand, considering that the spring stallion show, tried as an experiment at Exeter, had not answered the expectations of the Council—although he admitted there was a division of opinion on the subject—it was proposed to do away with it, and to endeavour, by the offer of good prizes, to get a respectable show of horses at the society's ordinary annual meeting.

The Earl of Portsmouth said nothing could have been a greater failure than the exhibition of horses for riding purposes at Exeter, and he was strongly of opinion that they ought not to give prizes at all for thoroughbred stallions, but to give good prizes for results. With this view he recommended a prize for 4 yrs. old hunting colts, an age at which it was easy to judge of a horse's character and qualities. The truth was the owners of first-class stallions would not show them at all, let them offer whatever prize they might; and he would remind them that though the stock got by a celebrated winner of the Derby (named) fetched a high figure as yearlings, they had greatly disappointed expectation. A long discussion ensued, in the course of which Colonels Acland and Luttrell and Messrs. N. Grenville, Pitman, Drewe, and others took part, and, subject to renewed consideration at the next meeting of council, should it be thought necessary, it was resolved that the spring horse show should be discontinued. As the Society will hold its next meeting in Gloucestershire (viz., at Bristol), it was resolved as a compliment to local breeders, that a special class for Cotswold sheep shall for this year be instituted; the prizes to be of the same amount as in the other sheep classes. The prizes given at Exeter for Dartmoor sheep not being thought applicable to a meeting at Bristol, were ordered to be discontinued. In accordance with suggestions by Earl Portsmouth, Col. Acland, Col. Luttrell, Mr. Pitman and others, the horse classes were entirely remodelled, and in the hope of getting better animals shown, a number of small prizes were done away with, classes were amalgamated, and considerably better prizes were substituted in the old classes retained and the new ones created. The prize-list was eventually referred back to the Committee to be e-modelled, in accordance with the suggestions of the Council; but it may be stated that, subject to future modification, it is recommended that at the Bristol meeting the following increased scale of prizes shall be given:—Cattle prizes: 3 years old Bulls £20 and £10, instead of £15 and £8; young Bulls £20, £10, and £5, instead of £15, £8, and £5; Cows in calf £12, £8, and £4, instead of £12, £6, and £3;

Heifers in calf £12, £8, and £4, instead of £12, £6, and £3; 2 years old Heifers £10, £5, and £3, instead of £6, £4, and £2. In the sheep classes the prizes for yearling rams are to be raised from £8 and £4 to £10 and £5, with probably a third prize not as yet settled. In the Horse classes there are prizes of £30 and £15 for agricultural stallions; £30 and £10 for the best hunting mare or gelding four years old; £20 and £10 for carriage horses; and £10 and £5 for Galloways not over 14½ hands. In reference to the prize list generally, Mr. Fookes said he had had considerable experience in judging, and he considered the prize list as now recommended would give very general satisfaction, and prove creditable to the society. Owing to the lateness of the hour, the other notices of motion on the agenda paper were directed to stand over till next meeting.

NEW MEMBERS.—Mr. Troyte, Huntaham Court, Bampton; Mr. A. Stewart, Barton House, Gloucester; Mr. C. A. Williams.

ARTIFICIAL APPLIANCES—STOCK VERSUS CORN.

At the Stow-on-the-Wold Society Meeting Mr. Dun said—They could not meet with men engaged in the same occupation as themselves, without learning something from them, and gaining a wrinkle. Their occupation as agriculturists was so extended that it called forth knowledge of many cognate sciences, and made a man look about him, especially when the price of corn was low, in order to secure a return for his outlay. Agriculture was in a transient state, and they began to know the value of artificial appliances. If a crop looked bad in spring, they were able by the application of soda and superphosphate so to alter its character, that at harvest it was found to be the most productive. He knew of farmers on the Cotswold hills who laid out as much in artificial manure as they paid their landlords; those were not isolated cases, but the outlay was made by hard working practical men, who farmed for profit. The time would come when all must use artificial manure to a greater extent, for it would not pay them to grow poor crops, and good crops could only be obtained by the aid of artificial manure. If they used artificial food for their stock, they would require less artificial manure, for they knew the value of oilcake not only as to its effect on soils, but as leaving a valuable manure behind for future crops. Another value of meetings like the present was, that it showed them the error of keeping second-class stock, which eat a great deal, and in the end yielded nothing. Foreigners might flood their markets with importations of wheat, oats, and barley, but they could not affect their trade in stock, for their resource was at home, and they could not be outbid in that respect by the foreigner, as they were in grain. As iron sharpened iron, so these meetings in bringing farmers together sharpened each other, and tended to make them farm on rational and scientific principles.

Mr. SAVIDON remarked that the last speaker had omitted to treat of one point, namely, steam cultivation. On Mr. Langston's farms they had four steam-ploughs, and were about to add a fifth, and he was satisfied both from experience, as well as from facts and figures, that to make land profitable they must adopt steam cultivation.

Mr. SEWELL remarked that Lord Leicester built good houses, and granted long leases, by which means land let formerly at 7s. per acre, had by the outlay made by the tenant farmer become worth £1 an acre and upwards. He had heard his lordship say that many of his tenants came to his rent audit in their carriages, and that it afforded him great pleasure to know that they were enabled to do so; and he hoped that all would in time do the same. He also mentioned that if he wanted to raise a quarter of a million of money, he believed he could find five of his tenants who would come forward with their £50,000 each.

Mr. R. GARNNE alluded to the fact that the family of the Garmes had been tenants under the Duttons for the last 400 years, and that he expended £600 a-year on artificial manure, on a farm of 1000 acres.

THE LEOMINSTER AGRICULTURAL ASSOCIATION.

At the Meeting held on Friday, Oct. 3, the stock was of the usually good quality, the heifer calves and yearling heifers more especially, as exhibited by Mr. Roberts, of Ivington, well maintained that gentleman's high position as a breeder of Herefords, and were worthy scions of his noble bull Sir Thomas. They were certainly the attraction of the show, while one of the three-year-old steers exhibited by Mr. Carwardine will, we expect, form a formidable competitor for Smithfield honours in 1884. The class for breeding-cows presented the most severe competition, and over and over were they scanned by the judicial eye before a decision could be arrived at. The sheep and pigs were not quite up to the mark, and, with few exceptions, displayed but little merit; but the sow and fine litter of Mr. Bradford were amongst these exceptions. In the horse classes we noticed, as a first winner, the black mare and colt of Capt. Haygate, winner of second honours at Worcester; and the fine old brood mare of Mr. Gregg was certainly well worthy of the commendation awarded her. The class for yearling hackney colts or fillies, as also that for animals under five years old, were both favourably filled. After the business of the morning, a large party adjourned to the Corn Exchange, where the chair was ably filled by Lord Bateman, who had not only kindly offered to preside, but conveyed to the committee the pleasing intelligence that Lady Bateman would also grace the table with her presence. This being quite a novel feature for Herefordshire, it was looked forward to by the men of Leominster with no small degree of pride, and caused the dinner-table to be graced by numerous ladies. Amongst the company were the Hon. Capt. Hanbury Lennox, M.P., and lady; Mr. King King, M.P., Mr. Midway, M.P., Mr. Gutherie Hardy, M.P., Mr. and Mrs. Chadwick, the Mayor (Mr. Marshall) and Mrs. Marshall, Mr. and Mrs. Evans, Mr. and Mrs. Taylor, &c., &c.

The following were the chief prizes awarded:

HEREFORD CATTLE.

The best Bull, of any age, shown with four of his offspring.—Cup, of the value of 5 gu., H. R. Evans, Swanstone.

The four best Steers, calved since the 1st of July, 1861.—Cup, of the value of 5 gu., John Williams, St. Mary's, Kingland.

The four best Heifers, calved since the 1st of July, 1861.—Cup, of the value of 5 gu., T. Roberts, Ivington Bury.

The four best Steers, calved since the 1st of July, 1862.—Cup, of the value of 5 gu., J. Taylor, Stretford Court.

The four best Heifers, calved since the 1st of July, 1862.—Cup, of the value of 5 gu., Thomas Roberts, Ivington Bury.

The four best Steers, calved since the 1st of July, 1861.—Cup, of the value of 5 gu., Henry Griffiths, Devereux, Wootton.

The best Bull, calved since the 1st of July, 1862, bred by, and the property of, the exhibitor.—Cup, value 5 gu., T. W. Vaughan, Lawton. Second prize, 2 gu., Thomas Roberts, Ivington Bury.

The best Fat Cow or Heifer.—Cup, value 5 gu., John Williams, St. Mary's, Kingland.

The best pair of Steers, calved since the 1st of July, 1860, and bred by the same person.—Cup, value 5 gu., Joseph Carwardine, The Wegnalls.

The best lot of Breeding Cows, or Heifers in-calf, or having had calves within six months preceding the day of show, and having been in the possession of the exhibitor at least ten months previously, in proportion to the quantity of land he occupies.—Cup, value 5 gu., Thomas Ree, Weston Bury. Second prize, 3 gu., John Burton, Lantley. (The whole class commended.)

For the rear of best Yearlings, with the exception of bulls (the whole rear to be shown).—Cup, value 5 gu., H. R. Ridler, Oxhouse, Shobdon.

A Sweepstakes of 3 sovs. each, with 20 sovs. added, for the best Bull, Cow, and offspring of the Hereford breed, open to all England.—J. H. Arkwright, Hampton Court.

SHEEP.

The best Ram of the white-faced breed, of any age.—Prize of £3, J. T. Pinches, Hardwick, Eardisland.

The best Ram of the Black-faced breed, of any age.—Prize of £3, James Taylor, Stretford Court.

The best pen of twenty white-faced Ewes.—Prize of £1, J. T. Pinches, Hardwick, Eardisland.

The best pen of twenty black-faced Ewes.—Prize of £1, J. Withington, Rosedale.

The ten best white-faced Yearling Wethers.—Prize of 2 gu., J. Carwardine, The Wegnalls.

The ten best black-faced Yearling Wethers.—Prize of £2, H. R. Evans, Swanstone Court.

The best pen of ten yearling white-faced Ewes.—Prize of 2 gu., J. Carwardine, Stockton Bury.

The best pen of ten yearling black-faced Ewes.—Prize of 2 gu., H. R. Evans, Swanstone Court.

PIGS.

The best Boar.—Prize of £2, Thomas Ree, Weston Bury.

The best Breeding Sow.—Prize of £2, John Bradford, Leominster.

HORSES.

The best Nag Mare and her Foal.—Prize of £3, Captain Haygate, Buckland House.

The best yearling Nag Colt or Filly.—Prize of £3, John Williams, St. Mary's, Kingland.

The best Cart Mare and Foal, of the same breed.—Prize of £3, H. R. Evans, Swanstone.

The best yearling Cart Colt or Filly.—No entry.

The best Nag Gelding or Mare, under 5 years old.—Prize of £5, R. E. Middleton, Shelderton.

The Judges were Mr. T. Duckham, of Bayham Court Ross, and Mr. J. E. Jones, of Springfield, Hereford.

LUDLOW AGRICULTURAL SOCIETY.

The 17th anniversary of this society took place within the ruins of the fine old castle, the court-yard of which was, as usual, kindly granted for the occasion by Earl Powis.

The show of cattle, which were entirely of the Hereford breed, was not quite so large as we have seen at former meetings, and with a few exceptions they hardly attained that standard of excellence for which they have heretofore been distinguished. Mr. Taylor's bull "Tamburine" (3254) and Morris' "Moderator" (3116) again met, when the decision of the Royal triumvirate at Worcester was confirmed, and thus that of Cirencester reversed; those with Mr. Robert's "Sir Thomas" (2228) were the only competitors for the grand sweepstakes; and therefore, the society's premium of £20 to be added, if five entries, is withheld in this class. We think we may unquestionably say "Sir Thomas," although unnoticed by the judges, was first favourite with the public; his fine character and great scale, combined with good quality, were the general theme of admiration, but he lacked that extra feeding which had been bestowed upon his more favoured competitors.

In the next class, for a bull and four of his offspring, there was only one entry, a bull of great scale, and four promising calves; with only three entries in the two-year-old, and four in the bull-calf class. Mr. Edward's Adforton (1839), added a first to his Royal honours at Worcester, although not quite in his then high condition. The first prize bull calf of Messrs. Vaughan's is a deep heavy-scaled animal, with plenty of good hair. The next objects of more than ordinary interest were two beautiful heifers from the Ivington herd, which showed that Mr. Robert's usual and well-known care had been bestowed upon them since their Royal defeat at Worcester, where one of these, Duchess of Bedford, was then placed second to Clementine. Amongst the lots of breeding animals, which are shown in four, irrespective of the acreage of land occupied by the exhibitor, Mr. G. Pitt, Chadnor, maintained his usual first place, taking three first prizes and one commendation, besides a first prize for fat cow.

The sheep were, as may be expected in this locality, of the Shropshire breed, and, with one exception, viz., the first prize yearling ram, they displayed extremely good character. Of that animal we heard some say he is a cross with the Cotswold, and others the Leicester; for our own part we thought he presented more the character of the Oxford Down. Be it what it may, he was certainly a handsome and good animal. But

then—aye, there is the *but*—the clipping into form wool that should have been sold after last shear day, had clearly much to do with his handsome appearance; and, although his wool was of a very light hollow nature (very unlike the others in his class), yet there was sufficient closeness in it to greatly favour the practised modeller. The flock of Mr. Hands was well represented, and, as usual, the majority of first prizes were awarded to his animals; Mr. Nightingale's forming good seconds, excepting in one class where they were first favourites. The competition in the pig classes was limited. The horses were in stronger force than usual, and amongst the "nags for hunter and road" were many good animals. The first prize mare, with foal at foot, was second at Worcester.

After the show a large company adjourned to "The Bull," where an excellent dinner was provided. Amongst them we noticed Earl Powis, the Hon. Capt. Windsor Clive, M.P., Sir Wm. Fraser, M.P., Sir Baldwin Leighton, M.P., the Mayor of Ludlow, Mr. Lanyde Roberts, Capt. Anderson, Messrs. Bayley, Clarke, J. Gregg, &c., &c. The speeches and toasts were, with few exceptions, the most unlike what they should be upon such occasions, as it was possible to make them. Scarcely was the subject which should engross the thoughts of the company at these meetings touched upon, and all appeared extremely guarded lest offence should be given in anything that may fall from their lips to disturb the harmony of the meeting; several of the warmest supporters of the society having withdrawn subsequent to the meeting of 1862, at which time Sir Baldwin's game-bill was so warmly discussed.

CHEESE AND STOCK v. CORN CROPS.

At the Dunham-e'-th'-Hill Farmers' Club, Lord BENNING said: Such societies as the present were of vital importance to the community, for the advance of agriculture was mainly attributable to their beneficial influence, and the healthful spirit of competition which they created. There were beneficial influences connected with these shows that ought not to be overlooked. Amongst the advantages to which he referred, were the facilities afforded agriculturists of coming together and seeing the practical results of their labours, of discussing the various topics of the day; and, as steel sharpens steel by coming in contact, so the mind of man became sharpened and expanded by coming in contact with the mind of his fellow-men. Here landlord and tenant met together on one common ground, vying with each other in a spirit of emulation which showed that a good feeling subsisted between them. He had always taken a deep interest in farming operations, believing, as he did, that every man who was connected with the management of landed property ought to make himself acquainted with, and master of such subjects. He hoped they would accept his remarks in the kind spirit he gave them. The farmer of the present day must be a farmer indeed; he must live as a farmer, and he must work as a farmer. The first question a farmer ought to consider was the best description of farm he ought to have; and he thought that few of those he was addressing would differ with him when he said that wheat-growing was not the thing to pay. He thought he was right in saying that the imports of grain into this country within the last ten years had been doubled; and the farmers who had to contend with dear land, high rents, and a variable climate, could not compete with superior land, abundant labour, and cloudless skies. It was his opinion that the area of farms should be rather diminished than extended, and that the production of cheese or stock would produce the largest returns. Too much care could not be bestowed in the selection of cattle; and Mr. Plakerton had said on this subject that "physical conformation is of the greatest importance. The deep, and at the same time wide, chest give room for the heart and lungs to play freely. The round ribs, having the vertebrae as nearly at right angles as may be, give a healthy digestive power. The breadth of loin naturally follows the round rib. The straight back and lengthy hind quarter must be added to complete the symmetry. The eye, too, requires attention. It cannot be too prominent, and, at the same time, gentle, as even in the animal world mind has its influence over matter." Thus they had what Mr. Plakerton called the points of beauty, and what constituted a good

and profitable animal. He (the Chairman) was pleased to see in the showyard a fair selection of agricultural implements. The steam plough and thrashing engines were now being much used. Steam was superior to manual labour; and one of the first studies of an agriculturist should be the saving of time. Lord Stanley, at a recent meeting, attached great importance to this subject, for, he said, the scythe and sickle must be superseded by the mowing and reaping machines; and the sooner the better. This question had been widely discussed; and there were some persons who maintained that the capitalist alone would profit by the change, and the small farmer and the farm labourer would suffer. He was not of that opinion. His belief was that, as far as the operative farm labourer was concerned, it would deprive him of doing some of the hardest work he now performed, and that relief he would gladly welcome. If even it became necessary for the small farmers to make use of the expensive implements he had alluded to, they could obtain them by hiring, or, better still, by forming associations for the purchase of them; and, if that were done, the small farmer had nothing to dread from the introduction of machinery of that description. Let them go hand-in-hand together, for union was strength; and, if they purchased such machinery, there was no fear of the small farmer going to the wall.

MR. KNIGHT'S EXMOOR PONY SALE.

The annual sale, by Messrs. Tomkins, of Exmoor ponies took place, as usual, in a meadow close to the Reading Station. The catalogue comprised 32 bays (four of them "buffy," and two "rusty"), 4 browns, 3 chestnuts, 3 blacks, and 9 whites and greys. Of these, 1 was rising four, 31 rising five, 6 rising six, and the other 13 ranging from nine to thirteen. They were considerably better broken than usual, as three men had been at them for several months, and the '64 lot will be backed and put forward still earlier. The younger ones were principally by the celebrated Sparkham Pony, Pandarus, and Palmerston, all of which were cut and sold at the sale last year, at an average of nearly 37 guineas. The pony stallions at home are of this blood, and 70 mares have been put to this spring. The lot this year showed a considerable improvement both in general size and action (many of them being nearer 13 than 12 hands), and the £1016s. average of 1861, when they were first sold at Reading, was increased to £18 19s. 6d.; this again was £1 7s. 6d. in advance of the average of 1862, which the three ex-stallions sent up so considerably.

The attendance was good, and among them, besides some ladies, we observed Lord Charles Manners, M.P.; Lord Claude Hamilton, M.P.; Sir John Lawrence, G.C.B.; Mr. P. Scrope, M.P.; Mr. F. W. Knight, M.P., and some present and past masters of foxhounds, besides London and country dealers. The highest price, 34 gu., was made for a very thick and appropriately named brown pony "Sang." "Dolly," a small but beautiful little dish-nosed mare, went for 20 gu., and the very bloody-looking "Pandarus," by the 42-guinea Pandarus of last year, made 17½ gu., and was purchased by Lord Charles Manners, who had been very carefully through the lots. "Palmerston" (24 gu.) was very strong and good, like his sire; "Touch me Not's" pretty tapering head rather than her bone helped her up to 19 gu.; and Mr. Scrope could not resist the beautiful action of "Nonsuch," even at 31 gu. Raglan (15½ gu.) and Ratcheter (17 gu.) both looked up to a much greater weight, and the pair of toy greys, "Little John" and "Squirrel," stepped nicely round the ring to the shaking of the red flag, and were got cheap for 18 gu. The lowest price was 5½ gu. for an aged mare, "Janet," and the total proceeds of the fifty were very nearly £700.

The interest of the day was considerably heightened by the appearance of the dark chestnut "Nelly," which was purchased by her present owner, a Berkshire man, for 11 gu. at this sale last year, and won the third prize for pony mares at Worcester. A year's high keep had effected wonders for her, and this very fair hint was not lost upon the bidders. On the whole it was a most successful sale, and a still larger assembly will no doubt meet under that tent next year, to greet another fifty batch after their 140 miles walk "direct from the Exmoor Hills."

AGRICULTURAL STATISTICS, IRELAND, 1863.

The following we extract from the clever report of Mr. Donnelly, the Registrar-General of Ireland.

The abstracts have been, as in former years, compiled from returns obtained by members of the constabulary and metropolitan police, who, to the number of nearly 4,000, were selected to act as enumerators. They have performed this duty in their usually efficient manner.

The enumeration—which extends over about 606,000 distinct holdings—commenced, this year, on the 2nd of June, and terminated in the middle of July.

The following summary shows the extent under cereal crops in 1862 and 1863:

ABSTRACT OF CEREAL CROPS.

	1862. Acres.	1863. Acres.	Decrease. Acres.
Wheat	356,321	264,766	91,555
Oats	1,977,528	1,948,986	28,542
Barley	192,302	171,238	21,064
Bere and Rye....	12,128	8,624	3,501
Beans and Peas..	15,202	15,148	54
Total	2,553,481	2,408,762	144,719

Decrease in cereal crops in 1863.. 144,719 acres.

According to this abstract there would appear to be a total decrease in the acreage under cereals of 144,719 acres, or 5·7 acres in every 100.

The area occupied by the different green crops, in the years 1862 and 1863, is given in the following table:

ABSTRACT OF GREEN CROPS.

	1862. Acres.	1863. Acres.	Incrs. Acres.	Decre. Acres.
Potatoes	1,018,112	1,023,628	5,514	—
Turnips	376,718	351,360	—	25,358
Mangel Wurzel and Beet Root	23,222	16,462	—	6,760
Cabbage	30,543	33,998	3,455	—
Carrots, Parsnips, and other Green Crops }	17,718	22,653	4,940	—
Vetches and Rape..	30,830	29,678	—	1,152
Total	1,497,135	1,477,777	—	19,358

Net decrease in Green Crops in 1863.. 19,358 acres.

GENERAL SUMMARY.

	Acres.	Acres.
Decrease in Cereal Crops.....	144,719	164,077
Do. Green Crops	19,358	
Increase in Meadow and Clover....	7,724	71,646
Do. Flax	63,922	

Total decrease in the extent of land under Crops in 1863 92,431

The decrease in the extent of land under crops this year compared with 1862, as shown in the above summary, is 92,431 acres: cereal and green crops having diminished by 164,077 acres; and meadow and flax increased by 71,646—flax alone to the extent of 63,922 acres. The total area under flax this year amounts to 213,992 acres, which exceeds by 89,418 acres the greatest extent sown in any year since these statistics commenced in 1847.

The fluctuations between 1862 and 1863 in the acreage under crops, grass, fallow, woods and plantations, and

bog and waste *unoccupied*, are given. There appears to be a decrease of land under crops in every province. Grass-lands have increased in Ulster and Connaught by 25,260 acres; and decreased in Leinster and Munster by 7,537 acres, leaving a net increase of 17,723 acres. Fallow has increased in the provinces of Munster, Ulster, and Connaught by 1,675 acres; and decreased in Leinster by 3,288 acres. Woods and plantations are returned as having decreased in Leinster by 1,743 acres; and increased in the other provinces to the amount of 3,158 acres; and bog and waste *unoccupied* would appear to have increased in all the provinces to the extent of 74,856 acres.

The increase in the column headed "Bog and Waste *unoccupied*," is owing to the withdrawal of live stock from the mountain and boggy pastures, consequent upon the decrease in stock, caused by the four last unfavourable years; but it may be reasonably assumed that with a continuance of genial seasons, the tracts of mountain and boggy pasture, which, from the causes mentioned, are not this year occupied by cattle, will ere long resume their former position, and contribute to the agricultural wealth of the country.

The following we extract from a table showing the number of live stock in 1862 and 1863. It appears that there is a decrease in 1863, as compared with 1862, of horses 28,715, of cattle 116,615, of sheep 152,201, and of pigs 89,522. In the value the decrease between the two years is, in horses £189,720, cattle £757,997, sheep £187,421, and of pigs £111,903, showing a decrease in stock in the hands of the farmers to the enormous amount of £1,227,041. Has all this money been hoarded, or have the farmers in Ireland been obliged to drag out their existence by living and paying rent out of capital? or will the deficiency be accounted for by the enormous drain on the population by emigration? We learn that in the first seven months of 1863, that is from January to July, both inclusive, no less than 80,506 persons have left the country, being nearly double the number which left in the corresponding months of the previous year. Truly we fear "there is something rotten in the state of Denmark." Have the priests no power to stop this drain? have the landlords of Ireland no inducement to offer to stay this loss of labour? For,

"A bold peasantry, its country's pride,
When once destroyed, can never be supplied."

The following extract is the only bright spot in the Registrar General's report.

"The average produce of the crops cannot be so satisfactorily ascertained until after the general harvest has been gathered in; but from inquiries which I have made in many well-informed quarters, as well as from the very favourable accounts given by the provincial press in all parts of the country, it may be fairly estimated that the yield of the cereal crops in particular this year will prove above the average which has been known for many seasons in Ireland; and although there is a falling-off in the total acreage, yet it is confidently expected that it will be compensated by the abundant produce of almost all crops—the total value of which, it has been computed, will in 1863 exceed that of the crops of last year by several millions sterling, and approximate to that of some of our best years: in flax alone the increase in value over 1862, caused by the larger acreage of 63,922 acres, combined with the abundant yield and superior quality, will, it is expected, amount to £1,000,000."

LORD GEORGE MANNERS, M.P., ON AGRICULTURAL AFFAIRS.

The annual meeting of the Newmarket Farmers' Club was held in that town on Tuesday, Oct. 6. The stock show was in the yard of the Rutland Arms, and the ploughing on the farm of Mr. Ratcliff, in the immediate vicinity. The silver cup, given to the farmer's son proving himself the best ploughman, was awarded to Mr. Wright, jun., of Swaffham Prior. In the evening, about eighty of the members dined together, at the Golden Lion Inn, the catering of the hostess (Mrs. Westley) being beyond all praise. In the absence of the Duke of Rutland, the president of the club, Lord George Manners, M.P. for Cambridgeshire, presided, supported by Mr. Adeane, M.P., Messrs. Beayon, Thorp (3), Ratcliff, Slater, Frost, Hervey, Dobito, King, and others, the principal agriculturists of the neighbourhood.

The CHAIRMAN, in proposing "Prosperity to the Newmarket Farmers' Club," said it was a toast of so much importance that he regretted deeply his inability to do justice to it; and he felt that inability the more because, in consequence of a combination of circumstances, he was unable to be present in the town at as early an hour as he could have wished, and, therefore, it was not in his power to devote that time to the inspection of the ploughing-field and the showyard as he could have desired; but he was enabled to take counsel with some practical friends whom he had had the pleasure of meeting, and relying, as he was justified in doing, upon their judgment, he was in a position to say that, as far as the ploughing went, there was a decided improvement upon the work that had been done in former years, and, therefore, he was justified in asserting that the chief objects for which the club was originally instituted were in course of realisation, and that, excellent as was the practice of farming in the locality previously, it was still year by year becoming better and better. This was as it should be; and they would agree with him that, if they were to combat successfully with unrestricted competition and low prices, it would not do to stand still. They must strain every nerve to be getting forward (cheers). He thought when agriculturists assembled together it was only fitting they should, in some form, express their thankfulness to an all-wise Providence for the bountiful harvest which had this year crowned their labours (cheers). It was of primary importance that they should have a good harvest this year, because there was still a large class of their countrymen (the operatives in Lancashire) who were wholly unemployed, or at least but partially employed, and, therefore, to that large body, it was of essential importance that, during the coming winter, prices should rule low; but, though low prices were very excellent things for the poor consumer, they were not so good for the producer, be he rich or poor. It was, therefore, a matter of some gratification to be able to reflect that the present low prices were not owing to increased importations of foreign corn, so much as from the state of their own stack-yards (cheers). He thought he could show, by reference to a very few figures, that that was the case. On referring to the last returns issued by the Board of Trade, he found that in the eight months ending the 31st of August, 1861, the importations of wheat amounted to 4,908,000 qrs.; in 1862, to 5,510,000 qrs.; and in 1863 to only 3,596,000 qrs. The imports of wheat meal in the same period were—in 1861, 5,030,000 qrs.; in 1862, 5,007,000 qrs.; and in 1863, 3,499,000 qrs. Testing it by the money value of the importations, he found that the value in 1861 was £15,657,000; in 1862, £14,579,000; and in 1863, £8,308,000. He further found that the value of the wheat and wheat meal imported from the United States of America amounted, in 1861, to £8,310,000, in 1862 to £6,376,000, and in 1863 to £3,271,000, showing, therefore, that there was not only a very material decrease from all countries, but especially (as they might have expected) from the United States of America. He thought this led them to reflect what their position might be as a nation another year, should the unhappy contest in the United States of America continue—and he thought he would be a very sanguine man who fancied he could see the end of it—when the importations must naturally

decline more and more, till, after a time, they would become small indeed; and, in addition to that (what was far from improbable), if there should be a war on the continent of Europe, shutting up, to a considerable extent, the sources of importation; and if, in addition to all that, they should have the misfortune to have a bad harvest—he thought their position would not be altogether satisfactory. Therefore, it seemed to him, considering all these matters, that it was wise for them to ponder the deep importance of striving in every way to increase the production of their own soil, and, if possible, to diminish the cost of it (cheers). He believed that steam cultivation alone would materially assist them in so doing. He must ask permission to express his conviction that they must look to steam cultivation to perform for them the double purpose of diminishing the cost of production, and increasing the amount of produce. In attempting to prove this, he should not offer them any silly theories of his own, but refer, for a moment, to a pamphlet which had been published by Mr. Hutchinson, Lord Brownlow's agent, in which the subject was fully treated. He dare say that many gentlemen in that room might have seen the pamphlet; and he thought those who had would consider that it deserved attentive consideration. He found, from Mr. Hutchinson's statement (these were facts which were the ascertained results of two years' continuous working upon a farm cultivated mainly by steam), that the cost of cultivating a farm of 546 acres for two years—by which he meant the cost of preparing the soil for the reception of seed—amounted to £562 2s. 9d., the cost per acre being 7s. 4½d. The estimated cost, upon the same farm, of cultivation by horse-power would have been £1,180 11s. 2d., and the average 15s. 5½d., leaving a balance in favour of steam cultivation of £618 8s. 5d., and a balance upon the acreage of 8s. 1½d. In addition to this, the money value in the second year of the increased produce was stated to have been £776 2s. 11d., or £98 2s. 11d. more than the rent of the farm. He imagined that the correctness of this conclusion must depend mainly upon the number of horses which the steam cultivation would enable the farmer to dispense with. Mr. Hutchinson said that one-third of the ordinary number would be amply sufficient. But, even if it were admitted that they could dispense with half, surely there was a great element of cost withdrawn; and a number of acres which had been employed in growing food for those useless horses would be free to grow food for men, or crops for the purpose of feeding beef and mutton (applause). No doubt the answer to that would be that the maintenance of those horses was necessary for the sake of their manure; but he believed that the increased fertility which would be obtained by the exposure of ten inches of soil to the action of the sun and air would more than counterbalance the fertility obtained by the manure of the horses. Then, again, in catching seasons, especially on clayey soils, when every hour was of importance, and they had a difficulty of getting upon the soil, they would obtain an advantage in steam cultivation. He believed, too, there was no reason why this cultivation by steam should not in an emergency go on by night as well as by day, for the steam-horse was never tired, and no amount of work ever put him out of condition (applause and laughter). Hitherto the extreme cost of the apparatus had been an effectual bar to its general application; but a public company (the General Steam Cultivation Company) had been formed under high auspices, by means of which it would be put in the power of every solvent farmer to possess himself of the requisite apparatus; and, further, it would be in his power, within four years, to become the proprietor of the machinery in question, and to pay for it out of the profits arising from its use. He (Lord G. Manners) would be the last man to introduce any controversial question into that room, or to allude to anything bordering upon politics—least of all should he desire to galvanise the dormant corpse of protection; but there was one branch of free trade which appeared to him to have worked so exceedingly ill that he really thought a case might be made out for some alteration. He alluded to the free trade

in live stock, the effect of which had been to cause a large trade in duty-free vaccine disease, for he believed it was capable of proof that the amount of good British meat lost year by year to the consumer was very far in advance of the amount which had been imported (applause). Therefore, the producer was in a materially worse position, and the consumer was materially injured as well. He did not know that it would be necessary positively to prohibit the importation of foreign stock, because it was very well known in London that a great deal of the bad beef was slaughtered in Aberdeen. He could see no reason why, if they chose to slaughter beef in Belgium or Holland, it should not be introduced; but experience had shown that the importation of foreign live stock was a blunder. The only other question which he thought it necessary to allude to was of a more social and domestic nature, viz., the employment of boys and girls in field husbandry. He was not so Utopian as to think that that was to

be dispensed with; but he would take that opportunity of suggesting that the employers of labour would do well to take every precaution that a certain amount of judicious surveillance was exercised over them, and that some well-qualified person should superintend, as far as possible, the work they were called upon to perform. He knew that was done in many places, and he believed with very happy results. With those few remarks, he begged to propose "Prosperity to the Newmarket Farmers' Club" (cheers).

The remainder of the toasts were of the usual constitutional and local character; but we should not omit to mention that in proposing the health of his Royal Highness the Prince of Wales, the chairman made the gratifying announcement that her Royal Highness the Princess is in the interesting condition which promises an heir to the throne of the kingdom—an announcement received with most jubilant applause.

ON CLOTHING HORSES.

The skins of our domestic animals, coated as they are with hair, do not as a rule require much additional covering, and it is only the finer breeds, with delicate skins, and accustomed to be covered, that do not resist the effects of a cold atmosphere. Habit leads to the necessity for horsecloths &c., which animals would not need if always exposed, provided they had sufficient room to move, and a certain amount of shelter, which is essential to all animals on the occasion of severe storms. Veterinary surgeons have often striven to overcome the strong prejudices which all persons connected with the stable have of keeping animals excessively warm, both at the expense of air to breathe and air to circulate around an animal's body. A sleek skin is, thus obtained at the expense of a sound constitution, and there is no animal more delicate than those submitted to the very extraordinary system of management of animals permitted by individuals who themselves delight in fresh air, sponge baths, light clothing, and constant exercise. Extremes should always be avoided, and if we are not inclined to recommend the practice of some veterinarians who, following, or rather exaggerating, the late Professor Coleman, place their horses adrift the coldest night when suffering from severe affections of the respiratory organs, and that even without the slightest covering, we nevertheless condemn the hoods and breastplates, and bandages, and two or three heavy rugs, which oppress and interfere with the proper aëration of the skin's surface. It must not be supposed by this that we look upon the animal-skin as a true breathing surface, through which oxygen is absorbed as by the mucous membrane of the lungs. The skin exhales freely, and the current of air on the surface favours the exhalations, and accelerates the discharge of the superficial cuticular cells, which are constantly replaced by rapidly forming cells on a healthy skin.

The error which uneducated persons commit is to regard clothing as heat-giving, whereas it confines the natural heat of the body, which is produced in direct ratio to the activity of the breathing and the circulation. No animal, then, should be swaddled so as to prevent its bending its limbs and lifting its head, and seeking warmth in exertion.

No animal should be permitted to shiver in the cold, and it is a wise rule to adopt that every animal should to all appearance be comfortable. We find animals, like human beings, removed from a hot to a cold climate suffering much unless clothed in the latter, and fatal disease in hairy dogs has been induced by exposure the first few months after being imported into England from India, Spain, or Italy.

But whatever animal has to be clothed, it should not be oppressed with heavy sheets, such as we find, piled one over the other, on our hunters and fashionable coach-horses. A wrinkle should be taken from the Frenchman, who is seen in the depth of winter with a blue blouse over a warm coat. The smock-frock seems to be destined to catch all the wind, and appears at first sight to be a cold garment, but experience

teaches us the reverse, and science explains its teaching. As the best material to keep a body warm is that which carries the heat off with the greatest difficulty, so do we find that all substances, such as wool and feathers, which imprison a considerable amount of non-conducting air around an animal, are those which are best calculated to maintain the heat of the body. The blouse, like a light linen sheet thrown over a common horse-rug, has a stratum of air beneath it which is an admirable non-conductor. We obtain the largest amount of heat with the least possible inconvenience to the animal in that way; and it is for this reason that, in bandaging the cold limbs of a sick animal, the bandages should be put loosely round the limbs, and not rolled round as if they were intended to cut the horse's legs in two. Hay and straw bands should also be rolled lightly round the limbs when required, and a very desirable way of favouring a healthy exhalation by the skin, and still keeping sick animals warm, is to place a layer of straw between a horse's skin and a common rug.

We look upon clothing in changeable and cold climates as essential, especially for horses; but we are anxious that it should be employed with judgment, and especially that the groom's labour should not be saved by such a preposterous practice as that of cutting a horse's natural coat off, and making up the deficiency by means of sweltering and unhealthy horse-rugs.

The clothing used for animals is not often beaten, brushed, and washed, but it is very essential to attend to cleanliness in this way. I have known the most violent irritation of the skin kept up to a great extent by foul clothing, and in some diseases of the skin it is absolutely indispensable to attend to the frequent changing and purification of the coverings for the body.

It is well known that, however necessary a free circulation of air in a stable may be to promote the health of the skin, as of every other organ of the body, it is indispensable to have the distribution of the currents uniform. Any special current striking against any part has the effect of lowering the temperature of the skin below the usual standard, and then a reaction occurs which is apt to be the cause of congestion and inflammation. This explains the occurrence of cracked heels from a draught of cold air playing directly on the heels of a horse standing in front of a door, when, perhaps, the only inlet for air is through a fissure left by accident, or occurring as the result of a door shrinking after having been fixed by a carpenter.

In order to keep a horse's skin in good order, it is indispensable to give him exercise, and occasionally exercise calculated to make him sweat. This facilitates the cleansing the skin of effete material in the shape of waste cuticle, which cannot otherwise be easily detached; and by attention to the rules laid down as to clothing, and not overfeeding, animals are found to live to a good old age in perfect health.—*Scottish Farmer*.

THE LATE SIR TATTON SYKES' STUD.

The interest excited by the sale and dispersion of Sir Tatton Sykes' justly celebrated stud of thoroughbred horses far surpasses anything of the kind on record; as, in fact, the collection of pure-bred brood mares and young stock was the largest in existence of which we have any knowledge.

Nor was the intrinsic merit of the horses, highly as they were esteemed both at home and abroad, the sole or even the greatest cause of attraction which brought amateurs and buyers from every corner of the kingdom, from many other nations, and even from the antipodes. The name and character of the late Baronet had the greater influence in attracting visitors, and no doubt enhanced the price of the stud so much beyond what it was estimated to be worth.

We might have abstained from entering on a description of the Sledmere stud and its recent sale—since almost every leading journal in the country had devoted some space to the subject—but for the desire to pay some small tribute of respect to the memory of a great man and his works; whilst, from our intimate knowledge of both, the exposition of our views on some incidental points may not be unacceptable to our readers.

Now, when the name of Sir Tatton Sykes has become engraven on the memories of all Yorkshiremen, and of men in all parts of the kingdom, and when the sale of the 813 lots of horses, with the £25,379 11s. as the price realized, have become matter of history, it may be well to inquire what instruction does the work just completed afford us as worthy of being transmitted to future generations. In treating specially of the stud, we do not pretend to take account of more than a part of the many good works which will cause the memory of Sir Tatton Sykes to be handed down to future ages as a benefactor. His claims as a practical agriculturist, as a landlord and stockmaster, we must leave others to do justice to, though all are worthy of praise. We never visited the Sledmere stud that we did not make it a study, and can furthermore say, that we never spent a day there without seeing something to instruct and much to interest us. And on the recent occasion—alas, the last opportunity left us!—the critical observation of each lot afforded the means to arrive at conclusions only to be drawn by comparison on a large scale where incidents are repeatedly presenting themselves.

Various are the views of men, as we have heard them expressed, as to the merits of the Sledmere horses; some denoting regret that such an unexampled stud should have been broken up; whilst others exclaim, What corn, grass, and other food this number of horses must have consumed!

In making our critical remarks on the late Sir Tatton's system of horse-breeding, we find much to admire, with much that is suggestive for future consideration; and yet, when reducing the whole to its proper economical standard, we conclude that the directions left, that the whole stud should be sold, affords the best proof of the wisdom of the testator. The history of that stud, and the patriarchal age to which the late Baronet lived, indicated the crisis which his death was to bring about as that in which a thorough change should be made—which it had been inexpedient, because not in accordance with the feelings of the great man, to inaugurate in the latter years of his life. Though the present Baronet intended to keep up a stud, as we hear he does, and if it had been optional for him to keep or dispose of the whole, we unhesitatingly say, that the course which has been adopted was the best to be followed. Every one knows how stock accumulates with time, and that even over a period far short of that in which the late Sir Tatton lived much will become cumbersome, which can with difficulty be cast off without a general clearing sale.

The history of the Sledmere stud would undoubtedly prove instructive and most interesting, were all the materials at hand for compiling it. The late Sir Tatton so outlived almost every one of the men who were his asso-

ciates in early life, that contemporary reports, as they refer to years long past, must be accepted with some reserve, though no doubt, since he was little addicted to change, and never withdrew from those who merited his esteem, much unwritten but reliable anecdote is available. We know from Sir Tatton's own mouth, that the stud, if not first established by, received most important additions, when Sir Mark Sykes, about the end of last century, bought Hornpipe, by Herod, out of Sister to Eclipse, for 1100 guineas; though it is more than probable that Sir Christopher Sykes, the father of the two last Baronets, had already set on foot an improved system of horse as well as of sheep breeding on his estates over the Yorkshire wolds, which he had brought from a state of barrenness "to be one of the finest corn-growing districts in England."

The late Sir Tatton sometimes related incidents, which had happened long before, with a clearness of memory and fulness of detail beyond any other man we ever knew. An instance may be referred to, as it bears on the history of the Sledmere stud. This was in the summer of 1857, when Sir Tatton related to us the incident of the purchase by Sir Mark Sykes of Hornpipe, by Trumpator, out of Luna, by Herod, sister to Eclipse, &c.

In 1802-3 Hornpipe produced fillies by Sir Peter Teazle, and the last produce of the two was presented by Sir Mark Sykes to his brother, the late Sir Tatton. These sister fillies produced in the same year (1810) Prime Minister and President, both of which became renowned stallions, as the stud-book shows. Some of the Prime Minister mares were the dams of very good race-horses. The dams of Physician, Charles the Twelfth, and Belinda (Belinda), were Prime Minister mares; and from the latter descends the last Derby winner, Macaroni; and President was probably the most widely reputed sire for getting hunters ever known in Yorkshire. Forty years ago, we remember when the late Messrs. Dyson of London travelled their strings of excellent horses from Yorkshire southwards, that amongst the most highly prized were the President horses; and even down to the present time one is constantly meeting with half-bred stallions and mares amongst the hunting classes in Yorkshire which claim near relationship with old President. The two Sir Peter mares, by means of the two stallions they produced, and one mare, sister to Prime Minister, effected much good in the Sledmere stud at an early date of its existence, affording more proof of what we frequently urge, on the influence of even a single mare under good management. The Teazle-Hornpipe mares combined in their breed the best blood of the pure English horse of that epoch—viz., of Matchem, Marske, and Herod. Fresh blood was at frequent intervals introduced into the stud by Sir Tatton, and in turn the best horses in the country were sought after.

The late Sir Tatton aimed to follow nature in all that he produced, and adopted Bakewell's theory in breeding horses, as he did with his sheep. In carrying that theory out in practice, admitting its soundness, there is great liability to err, especially in the choice of stallions for particular mares; these, as Sir Tatton knew well, may be large and powerful without being high; as an example, if we were asked to name a stallion most likely to produce a Derby winner from Borealis, we should certainly not look for one limited to her own height, but should probably decide on Stockwell as our selection. In excluding some of the large and coarser type of horses, we believe that Sir Tatton's as a racing stud was under disadvantages. Horses as well as men form new families, with inherent peculiarities. Of such instances numerous examples might be cited. Sir Tatton, however, did not like a large stallion, and though a first-class rider, sought speed with power in a handsome horse, and never could be induced to like a plain one; hence his stud was founded in character after his own taste. We never saw a large coarse horse or mare amongst the selections at Sledmere, and never saw one of the latter there with a plain head, but, on the contrary, all were as

fine and pretty as the purest Arabs of the Desert. As the Sledmere stud was differently managed to any other in the kingdom, it may be well to consider the results relatively with that and others kept on smaller scales. To acquire an insight into the management, the liberal spirit and good taste which characterised the whole aim, and ruled in the selection of mares and stallions, it is necessary to go back many years in the inquiry, to be able to understand the early state and subsequent development which the establishment has received, when we shall find how much it differed on the whole from anything we are accustomed to see in those of recent times, which almost exclusively aim to produce stock for the turf.

The first aim of the Sledmere Baronets was to produce high-class hunters, and to improve the breed around them of that class of horse. As is well known, love for the animal and his cultivation formed the great feature in Sir Tatton's character; and the earnestness and application with which he pursued this object have never been excelled, and seldom equalled. As the numbers of mares multiplied, and the peculiar notions which Sir Tatton entertained, of keeping them to very mature age before they were put in the stud, and by his carrying out the same practice with the geldings which were to be converted into hunters and riding horses, the effect was that of swelling the number of animals on the estate without tending commensurately to profitable result; whilst the cost of keep became proportionally high, and the stud so spread out, that, beyond the sound land and good pasture in season, there was not, and could not be the same care, handling, feeding, &c., which are found to form such essential steps in the development of the colt to form a race-horse. The Sledmere stud was distinguished from the first as being an amateur establishment, as it always continued to be, all modifications notwithstanding; the system pursued may be regarded as an improvement on those of continental nations, and as one that can only be imitated where land abounds and hands are scarce; and even then the practice of keeping mares fruitless until six or more years of age, and horses destined to work, almost as long before they are brought into use, is nowhere advisable. We regard it as not merely costly, but contrary to what experience and rational views teach us—as calculated to make the most of horses.

It has been commonly remarked that the Sledmere stud has furnished a small proportion of good race-horses relative to its magnitude and purity of blood; and since we believe the notions prevailing to be founded in truth, we do not hesitate to inquire into the cause.

Some, whom we have heard discuss the question, say that the mares, though sound and of good stamina, lack quality; that they were thick in the shoulder, and better adapted to produce hunters than race-horses. From such notions we entirely differ, and regarded most of the animals as wide and well-proportioned, such as we shall always find to prevail where the mares have freedom, and are amply fed on good land, such as the Sledmere stud had. The stock will soon become narrow, and look lengthy and fine when brought into use for racing purposes. The reason why the proportion of great winners produced from Sledmere was relatively small, may, we believe, be easily accounted for, while the excellency of the stock is admitted.

The breeding of race-horses constitutes an art, and differs in some essential points from that required for producing horses for other purposes; and it has become more and more so in modern times compared to former periods, when horses were not raced until they reached the age of four or five years; now it is said, that unless they can run at two and three, they do not pay for training. Here we see cause why the Sledmere stud did not furnish winners in number equal to many others, and it is not necessary to determine whether the custom of running for most of the great stakes takes place at too early an age is at fault, or whether the system pursued in the late Sir Tatton's stud was too much of a waiting kind to enable his colts to meet the Bay Middletons, West Australians, Blink Bonnies, &c., which had from the time they were foaled received all the advantages which nature and art combined could confer. That which appeared the more natural course to Sir Tatton, however well it may have succeeded with horses to be brought out late to work, could not bear the test of early competition. We find that his method was at the opposite extreme to those now commonly adopted; and, whilst the practice has been gaining

ground of breeding blood stock too artificially, by which means it obtains bulk and height, at the expense of form and power, the stock having too little liberty for exercise, and insufficient time given for growing into form, and for consolidation of texture; the not supplying them with all the benefits which regulated allowance of concentrated dry food imparts, with warmth, shelter, &c., in due order, were disadvantages which no after hurried means taken could repair.

Although the late Sir Tatton did occasionally send some mares to different stallions, the whole number, with such exceptions, were put to his own two or three horses; hence the stock was found to be more successful in some seasons than others, depending much on the horses used. Reference has been made to some of the very best stallions used at the Sledmere stud at early times. Comus was one of the horses Sir Tatton used most with the best success. That famous horse produced good hunters, left a number of good mares; and it was from the same stock that the stud achieved a great repute on the turf, when Grey Momus, in 1838, was one of the best horses of that period, and was a very fine animal. The late Lord George Bentinck, who became possessed of Grey Momus, prized him so much, that when that nobleman, about the same time, bought Bay Middleton, as a stallion, he invited Sir Tatton to send "the whole family of the Momuses" to that great race-horse at Doncaster, where the horse was located. Accordingly Sir Tatton sent the Cervantes mare, Grey Momus's dam, and some of the Comus mares.

We do not recognise any time when the Sledmere colts were so good in equal numbers, at the age of two and three years, as those of Womersley's produce. The Birdcatcher and Touchstone blood seems to have suited the Sledmere mares, as was shown by the Womersley stock, and separately by that of Daniel O'Rourke and Rifeman more recently; while those two fine sons of Pantaloon, Sleight-of-hand and The Libel, have done good service in the stud, especially in producing a lot of capital mares.

There was a defect in the management of Sir Tatton's stud, which was in some measure due to excess in the number of animals kept, and which, in taking this critical sketch, must be noted. It was the keeping of many horses during the winter in farmyards, where they were constantly standing and moving in wet up to their fetlocks. To this the whole stock in the stud were not equally exposed; it was the geldings, which were kept on for making hunters, that were most of all kept in that uncongenial state. Whilst dilating on this, which is a common error, not only in stud managing, but in that of managing horses generally, we may say that Sir Tatton was conforming to the theory which prevailed, viz., that wet was good for horses' feet; and since no man we ever knew, equally informed with the late baronet on things he undertook, was so open to receive suggestions, it may be necessary to explain why we have deferred until now to mention the above defect in the management. In the first place, we had formerly either been at Sledmere in the summer, when all the horses were in the best possible state, on the finest of well-cultivated, dry pasture-land, or else in the winter in frosty weather; so that it was only in latter years that the mistake occurred to us. Moreover, the evil effects of keeping horses' feet wet were occupying our attention; and so much did what was met with at Sledmere lead to confirmed conviction, by seeing the horses in the wet yards, that it proved one of the means which enabled us to reduce to demonstrable system that which before experience had only enabled us to understand as isolated phenomena. Yet, with all the good will, we could not advise at the time; that great crisis was approaching when only such changes as suggestions would have called for could be adopted, and therefore we refrained from reference to the subject, even for the purpose of illustrating our views. The summer condition of the horses formed so great a contrast to that just referred to, that much of what the feet suffered at one period was recovered in the other; but such did not come up to steady and perfect development of structures: it was at best like feeding a young animal well one six months, and not continuing to do so the other.

We have no doubt that it was possible, at the recent disposal of the stock, to have selected twenty-five mares out of the number (admitting the general high character of all of them), and that with such reduced number, kept on parts of the same estate, differently managed, and put to a sufficient

variety of good stallions, more good horses could have been produced, and more money realized by the sale of colts and fillies, than resulted from all that were annually sold in past time. We believe that the breed of the Shetland horses is excellent: the mares come down from the best types of blood, and being well-selected, sound in constitution and limb, every

degree of perfection in their produce may be expected. There are, moreover, plenty of stallions which will cross well with these mares—the Touchstone, Birdcatcher, Melbourne, Sweetmeat, and Voltigeur blood we should select from, with that of several other families in constant formation, in succession.—*Edinburgh Veterinary Review.*

HAS THE FARMER GOT HIS FAIR SHARE OF FREE TRADE?

Mr. G. W. BENTINCK, M.P., said to the members of the Marshland Agricultural Society, at their late meeting: I will ask your permission to say one word, and I ask it the more readily because I venture to think that the subject to which I shall call your attention is one which is most closely connected with the object which we have in view in assembling to-day. I apprehend that object to be the promotion of the welfare and the prosperity of the rural districts of this country, and the subject to which I would wish to call your attention has precisely the same tendency. Now, do not mistake me, or be alarmed at supposing, from any word which may drop from me, that I am going for one moment to inflict upon you a long discussion upon the question of that much-veiled subject of free trade. We have all our opinions upon it. I have never changed mine, and I have never seen reason to change it. Other people are equally tenacious, and think themselves equally right. Who is right and who is wrong remain to be proved. I do not go into that question; but when I have assembled before me a large body of gentlemen closely connected, on a large scale, with the cultivation of the soil of this country, and assembled as they are here for the purpose of promoting the interests and the benefit of one of the most fertile agricultural districts in England, I cannot refrain from begging permission to ask one question as to the state of the rural districts of England with reference to the question of free trade. Mind, I do not go into the question of its merits at all: I leave that to other times and other places for discussion. I merely want—assuming the question to be right or wrong, as anybody may choose to assume it—to go into the question of its application as far as the rural districts of England are concerned. Now, how do we stand in the rural districts of England (and by that term I would beg to be understood to mean all those districts which are devoted to the cultivation of the soil of the country)—how do we stand with respect to the practical operation of free trade? If free trade means anything (I do not want to raise discussion by that way of putting it); but, if it means anything, I think I am justified in saying that it means unrestricted competition. Very good. I am glad to hear that that view of the subject is assented to. Now, what does unrestricted competition mean? I apprehend, without presuming to have discovered any new light upon the subject, that unrestricted competition means at least this—that, if you are not to have the benefit of protective duties, that, at least, in bringing to market the produce of your industry, you shall have no antagonistic impediment in operation; that you shall start fair with other strugglers in the market of the world, and that neither favour nor affection shall be shown to one side or the other. That, I think, is the fair meaning of unrestricted competition. (Hear, hear). Well, I am glad to find that you adopt the light in which I have endeavoured to express my view of the subject. Let us now see how we stand in the matter of unrestricted competition. I think it would be a work of supererogation to ask such an assembly as that which I have now the honour of addressing, if they are aware of the fact that out of the large revenue collected in this country, five millions are derived from the duty on malt. Those duties upon malt, so derived, are a direct tax upon one of the most important of our cereal produce. Take off those duties, and not only the value of that produce, in my opinion, would be increased, but the sale for it would be enormously extended. Well, do you call that unrestricted competition? Is that carrying out the principle of free trade? Mind, I am not arguing whether the principle of free trade is right or wrong; but, what I want you to say is, whether it is carried out or not. I ask you whether, with unrestricted competition forced upon you—at least I say, forced upon me, for I venture frankly to say, putting my own

opinion forward, that I never liked the system, but adopted it as a necessity—I want to know whether you have got unrestricted competition? I venture to say you have not. I have shown you one instance in which the produce of the soil (and that produce being subjected to unrestricted competition) is at once subjected to a tax of five millions per annum. This is one part of the question. There is another part of it which does not probably affect this part of the country. But, in all these matters the great thing is to deal fairly with everybody: do not fight your own battle alone, but fight the battle of every man who is wronged. Now, take Ireland, and take some portions of England: I am not prepared to say to what extent it goes; but this I am prepared to say, upon good authority, that there is a great district in Ireland, and there is a certain extent of land in England, which could grow, to a much greater profit than it can any other produce, tobacco. Now, how do you stand with regard to tobacco? Mind you, unrestricted competition, free trade, no protection, but unrestricted competition in the market to all competitors. Well, you stand in this position—that a still larger amount of duty is levied every year for the revenue by the prohibition that you shall utilize the soil of this country for the growth of tobacco, in order that you may levy a customs' duty of so many millions a-year upon the importation of foreign tobacco. Well, is that unrestricted competition? But I go further, gentlemen: I ask you, is it common sense? Is it common justice? Is it reasonable? Is it rational? Is it tolerable? But, thinking as strongly as I do upon the wrongs of the rural districts, because I hold it to be a wrong—I hold it to be a gross wrong, I hold it to be an immense wrong, a wrong so enormous and so flagitious, that I will undertake to say the parallel is not to be found in the financial history of this country—I ask whom does that wrong rest with? (because there is nothing like searching home and seeing where the root of the evil lies.) I venture to think that that wrong rests with ourselves; and I will tell you why I think so. It is a very simple question of statistics, of figures, or I might simply say of facts. Holding, as I do, indisputably, that the interests of all connected with the cultivation of the soil are one and inseparable (and I will defy even *The Times* newspaper to disprove it), it is a very simple question of facts to ascertain that the amount of property and of numbers, and of capital employed in the cultivation of the soil of this country, exceeds that of all the other commercial interests put together. That is not a matter of opinion: it is a matter of fact. Now, let me ask any gentleman here present, does he suppose that there is any other great industry extant, with the exception of what is commonly called the agricultural interest, but which I think ought to be more fitly described as the interest of the rural districts of the country, because that more fairly describes its comprehensive character—is there any other interest in this country to be found, who would submit for one hour, or for one minute, to the intolerable injustice which I have just brought before you? Apply it for one moment to any one of the great interests of this country, which, in point of numbers, in point of wealth, and in point of extent, are as nothing as compared with the great rural interests of the country, and what would they soon do and say? Would they submit to it for a second? Not they. They would do this—they would do what the rural districts of this country have never done—they would band themselves together to a man, and they would say, "We will not submit to this gross and this glaring injustice. We will never rest till that injustice is remedied. We will make an appeal to the parliament of the country. Until that injustice is remedied, our voice shall not cease to be heard." But is that the case with ourselves? We grumble amongst ourselves. We

say that we are over-taxed; and it is quite true that we are over-taxed; and if we go on much longer as we are now, we shall be still more over-taxed, because every year adds something more to the burdens which are imposed upon the rural districts of England. But whom have we to blame? Why, I at once say we have ourselves, and ourselves only, to blame. It is quite true (I don't want to go into political questions) that, by various combinations and arrangements which have occurred during the last few years, there is no doubt of the fact that the rural districts of this country are inadequately represented in Parliament—that is to say, that they have not, in proportion to their numbers and to their property, within a very large number, the amount of representation to which they are entitled.

SHEEP AND THEIR WOOL.

EAST RETFORD, SEPT. 23.—Perhaps of all the animals with which the Creator has blessed the English nation, sheep are the most prominent, the most prolific, the most useful, and the most valuable. Whilst living, they provide the best and warmest nourishment for our bodies in the shape of clothing, and afford the richest nourishment for our land; and, when dead, their carcases supply the best food that the human system can participate in. But all descriptions of land are not so particularly adapted for the breeding and feeding of this useful animal as others. It is principally on the lighter soils where they best thrive, but it is those soils also that are the most benefited by the keeping up the breed of sheep. What would North Nottinghamshire now have been without this useful animal, which supplies both food and clothing, and is indispensable to our comfort, and almost to our very existence. In an agricultural point of view, they are of vast importance. Every individual is interested in this great staple commodity—from the peer who occupies the woolstack, to the industrious peasants who card and spin. Sheep have been denizens of this country for many centuries, and of course their prices have fallen and risen in proportion to other commodities, especially the value of corn and the other necessities of life, which were the standard of value for centuries after the Norman Conquest. But sheep then were far different from what we have brought them to in the nineteenth century—small and lean, and almost woolless. From information collected from the archives of the corporation of Retford, and from Fleetwood's "Chronicon Precosum," we gather the following to have been the value of sheep and wool in ancient times: In the reign of Henry I. a sheep was valued at 4d. In 1185 a ram was valued at 8d.; and, about the same period, 500 sheep were sold for £32 10s. In 1191 a sheep sold for 10d.; and in 1195, 100 sheep were sold for 4d. each. In 1302 a fat sheep fetched 1s., and an ewe 8d.; but in 1314 a fat sheep in wool was worth 20d. In the year 1339 the price of a tod of wool was 10s. In 1390 wool was so cheap, in consequence of certain towns only being staple towns, persons being forbid to carry it elsewhere, that it was sold for 3s. per stone. In 1423 a ram was worth 8d. In 1500, a wether, unclipped, was valued at 20d., a lamb 6d., and a hogg sheep (shorn) 1s. In 1698 the exportation of English wool was prohibited; but soon afterwards the restriction was removed. The export was again prohibited in 1718, and was not wholly repealed until 1824. In 1678, to encourage the growth of this staple, all persons dying in England were obliged to be buried in woollen, or the persons directing the funeral to forfeit £5; but this foolish restriction was abolished a few years afterwards. But what a mighty change has been brought about in the county of Nottingham, which has from time to time produced some of the finest sheep, for both mutton and wool, to be found in the world. It is calculated that from 60,000,000 to 70,000,000 of sheep are annually bred and kept in England. The Hundred of Bassetlaw, which contains an aggregate of 205,000 acres, has not less than 180,000 sheep located within its bounds, which have produced, during this season, about 45,000 tods of wool, and which, at present prices, cannot be valued at much less than £110,000; so that, reckoning the value of the carcase in conjunction with the wool, the actual value of the sheep in this district cannot be much less than £350,000. It was not, however, until a few years after the

commencement of the present century that sheep breeding to something like perfection manifested itself in the district. The Chesterfield Canal began to develop its advantages, and other useful communication began to display themselves. The face of the country underwent a change, and the breed of sheep improved in consequence. In a few years afterwards we find the names of Hodgkinson, Foljambe, Allison, Machin, Burgess, Sanday, Parkinson, Rose, &c., conspicuous in the movement, and rivalling each other in this useful branch of progressive agriculture. Their respective families have rendered themselves famous, and their names will descend to posterity as having been benefactors to their country and their kind. Owing to the present high prices of cotton, arising out of the American war, wool has attained a higher price than it was ever before known in the history of this country, and, we think, must have almost reached its culminating point. In the district of which East Retford forms the nucleus, there is scarcely a clip left to be disposed of. All has been purchased in this important agricultural district at prices which formerly have been thought fabulous, and beyond credibility—certainly never before obtained. Mr. White, of Babworth, has sold his clip at 50s. per tod! Mr. Johnson, of Morton, in the same parish, has made 55s. per tod of his clip, realizing near upon £2,000. Mr. W. Walker, of the same place, has realized 53s. 6d. per tod. From the late genial season, the wool this year, generally, is admitted to be considerably better than usual—fine in quality and texture, more so than for many years past. The season for feeding sheep, too, has been generally good. The last winter and spring were dry, and the weather which succeeded was highly seasonable to all the flockmasters in this our highly-favoured district.—*J. S. P., in Doncaster Gazette.*

EMBANKING OF THE THAMES: UTILIZATION OF SEWAGE.

The object is most truly desirable and important to have the bed of the river embanked throughout its course in the district of the metropolis, for the sake of convenience, advantage, and the architectural appearance. The present condition is a mass of the most inconvenient and awkward arrangements, which are, in truth, devoid of the name; and the appearance is of a description that is most disgraceful. Two chief objects are to be attained—to clear the river of all stationary shipping, and to erect the necessary conveniences of docks and wharves. No national object can be more important, and has been long deserving of the most serious attention.

The embankment must begin at the mouth of the river Lea, cut the neck of the Isle of Dogs, and follow the windings of the river above Chelsea, ending in termination where no traffic is done, and may not be expected. Two walls of stone, of the proper height above high-water mark, will confine the river to half its present width, and may be built with granite, or, at least, the outer sloping face to be lined with that stone. Stairs will descend to platforms of stone, alongside of which the steamboats will come to discharge and receive passengers at the proper distances of stations. The top of the wall is wholly confined to pedestrians, and safely guarded on both sides by an iron railing. In front of the present shore buildings a second wall is built, lower than the outer one, perpendicular in front, for the purpose of loading and unloading the cargoes; and on its top runs a double line of railway to convey the goods to the respective stores and deliveries.

Below London-bridge, and commencing at that passage over the river, the space that is contained between the outer and inner walls is divided, by cross walls, into docks for special purposes, and into which all vessels are passed to unload, so that the river is wholly cleared, and open to steamboats only. The docks are known as the East India, West India, Baltic, Mediterranean, Continental, Scotch, Irish, American, Coal-wise, and so on. Heavy goods, as coals and potatoes, are conveyed in keels, lighters, and barges, up the river to the respective places of use. Light goods of all kinds are conveyed on the railway on the tops of the inner wall to the storehouses that will be erected near to the wall, and to the streets that will join the line of railway. The docks are opened and shut by flood gates, which accommodate all the unloading and loading of vessels, and other purposes. Best

restricted to special articles, a very useful order will be introduced, and much confusion prevented.

Above London-bridge, and to the western end of the embankment, the space between the outer and inner walls may be much narrowed gradually up to the upper extremity, as large docks are not required, but only receiving places, at which barges, keels, and lighters are entered, to deliver the goods that are sent up the river. The entries may be open, and closed with gates, as the use may be seen to require. The tops of all walls to be secured with railings against accident.

This scheme will form a very just national undertaking, to be done promptly and comprehensively, and not frittered away in patchwork that never shows any compass of design or dignity of conception. Time is lost, and the general purpose is deferred; unity is postponed, and the result is not perceived.

SEWAGE.

The first idea of using sewage, along with the scheme of embanking, suggested to form a large arched tunnel underneath the inner wall, into which all the conveying drains would fall that at present run into the river, and the contents carried to an eastern extremity, and there taken up for use. The main drainage of the metropolis now effects this purpose, and makes the discharge in the same manner as by the embanking tunnel. An open cut will convey the river of sewage to the grass lands downwards along the river, and there applied to irrigation. Grass lands are the legitimate purposes of sewage application, which can be valued at little, if anything beyond the common river water, or muddy brooks, arising from the very extreme dilution of the matters in the large quantity of water gathered over the extensive surface from which it is collected.

No deodorising is required; nor will any miasmata, pestilential vapours, or noxious effluvia arise from any running stream. These products arise from profuse vegetations putrefying in stagnant waters, and acted upon by far more powerful suns than are possessed by the British Isles.

The application of the sewage from the discharges of the main drainage forms a most appropriate object for the employment of a company, which could, with great advantage, direct its efforts to all similar points of agricultural advancement that are not yet half developed.

Simplicity of design, comprehensiveness of purpose, and promptness of execution, form the distinguishing marks that are introduced into designs of an extent to merit notice. In this case of embanking, and use of sewage, there is obtained a very large convenience of dock accommodation, with the river wholly cleared from shipping—a free and open passage to steamboats and pleasure parties; a deep and rapid stream of water, sweeping along all impure matters that may get into the current; and an architectural improvement, to remove the disgrace that has ever been attached to the most extensive commercial emporium that the world has ever employed. Stone quays are none, or very few; and any seaport in the kingdom is better provided in that respect than the metropolis.

It most unfortunately happens that the persons who have the power and the means in such affairs are generally one entire generation in wisdom behind those who are less employed and less conceited; and no inferior person must presume to disturb their repose, or jostle their prejudices. Hence, the insufficiency of national undertakings.

CORN AVERAGES: MICHAELMAS RENTS.

SIR,—At this time, being the termination of the *Farmer's year*, it will be interesting to your agricultural readers to take a view of the progress of prices in *Wheat*, *Barley*, and *Oats* during the 52 weeks ending Michaelmas, 1863.

The averages, deduced from the weekly returns published in the *London Gazette*, and which I annex, give the following results, viz.:—

	s.	d.
WHEAT	46	8 per imperial quarter.
BARLEY	34	3 "
OATS	21	9 "

The following abstract shows the dates of the *highest* and *lowest* prices during the same period:—

HIGHEST PRICES.

LOWEST PRICES.

Wheat, 10th Oct. 1862, 51	s. d.	1...20th Oct., 1863, 43	s. d.
Barley, 18th Mar., 1868, 36	10...	24th July,	28 10
Oats ...10th July,	24 0	{ 23rd Jan. }	20 2
		{ & 2nd Oct. }	

DIFFERENCE.

Wheat 7s. 4d. Barley 8s. 0d. Oats 3s. 10d.

The fluctuations in the price of wheat have been less than in any year since 1851.

I remain, Sir, your most obedient servant,

CHARLES M. WILLICH,

Actuary University Life Assurance Society.

25, Suffolk Street, Pall Mall East, S.W.,

10th October, 1863.

WEEKLY AVERAGE PRICE PER IMPERIAL QUARTER IN ENGLAND AND WALES.

[Per London Gazette.]

		WHEAT.		BARLEY.		OATS.	
		s.	d.	s.	d.	s.	d.
1862—							
Oct.	10...	51	1.423	35	5.175	22	5.583
	17...	49	6.028	34	8.856	21	5.021
	24...	48	11.121	34	5.143	21	7.215
	31...	48	4.888	34	5.558	21	8.113
Nov.	7...	48	7.026	35	1.987	20	10.184
	14...	49	8.924	35	9.768	21	1.780
	21...	49	4.617	36	4.560	21	5.800
	28...	48	9.719	35	10.366	21	9.349
Dec.	5...	47	8.408	35	4.942	21	3.641
	12...	46	9.630	34	10.052	20	10.101
	19...	46	10.512	34	9.167	20	7.284
	26...	46	5.618	34	7.708	20	6.480
1863—							
Jan.	2...	45	7.009	34	1.639	20	4.001
	9...	45	10.818	34	5.489	20	5.511
	16...	46	10.586	34	6.785	20	6.309
	23...	47	10.377	35	0.796	20	2.608
	30...	48	4.400	35	8.864	20	9.007
Feb.	6...	47	11.432	35	9.428	20	10.978
	13...	47	7.680	35	11.888	20	4.541
	20...	47	2.904	36	3.608	21	8.672
	27...	46	6.361	36	5.148	21	8.835
Mar.	6...	46	7.139	36	5.977	21	9.597
	13...	46	2.023	36	10.263	21	11.197
	20...	45	3.799	36	7.294	21	4.361
	27...	45	0.208	36	9.140	21	6.194
April	3...	45	4.325	36	5.508	21	2.732
	10...	45	9.687	36	6.860	21	5.431
	17...	45	6.926	35	8.098	21	5.754
	24...	45	6.888	35	4.508	21	6.435
May	1...	45	8.433	35	3.762	21	11.425
	8...	45	9.126	34	6.080	21	2.518
	15...	46	2.786	34	4.325	21	2.320
	22...	46	9.990	34	5.372	21	11.168
	29...	46	8.096	35	9.624	21	6.185
June	5...	46	5.802	35	8.798	22	3.971
	12...	46	10.340	31	11.967	22	10.674
	19...	46	11.111	32	4.246	22	10.210
	26...	46	9.771	30	7.506	22	0.441
July	3...	46	5.981	31	2.824	23	10.349
	10...	46	11.731	30	9.919	22	10.994
	17...	46	10.745	30	10.781	23	6.980
	24...	46	7.869	28	10.651	23	6.997
	31...	45	11.656	29	10.597	23	9.005
Aug.	7...	45	11.259	31	0.511	22	0.192
	14...	46	8.371	31	6.857	23	0.084
	21...	45	11.969	31	4.668	23	7.337
	28...	46	5.357	31	1.970	23	0.772
Sept.	4...	45	9.566	33	10.390	22	8.322
	11...	44	2.817	34	8.067	22	0.649
	18...	44	1.963	34	7.248	21	8.726
	25...	44	9.197	35	2.482	20	9.999
Oct.	2...	43	9.174	35	9.514	20	2.992
			52	2429	9.970	1783	2.929
						1131	11.399
Average...		46	8.730	34	3.517	21	9.219

REVIEW.

JOURNAL OF THE ROYAL AGRICULTURAL SOCIETY.

A little grace may be certainly allowed over the preparation of the Royal Agricultural Society's Journal, when the aim is to embody in its pages a history of the Summer Show. It is not so many years since that such digests and reports came out indifferently in the next Part but one or two, and at just about the appropriate period when the agricultural world was forgetting the last Meeting in the advent of the next. The new number consequently carries with it the best of apologies, if, though promised in August, it be not circulated until the end of September, while it can offer notes on the trials and classes at Worcester ere the interest in the occasion has yet died out. In fact, it is seldom that we have seen a *Journal* so calculated to take a direct hold upon the public attention, as many of the points advanced will no doubt afford material for immediate as well as continual discussion. Prominent amongst such papers, and supplying, indeed, the very backbone of the number, are those devoted to some further consideration of the great question of the day—that of cultivating the land by steam-power. There are no less than three separate articles on this topic, all elaborately got up, and occupying in mere space quite the lion's share of the contents. The first of these is the prize-essay on *THE RESULTS OF STEAM CULTIVATION*, as awarded to Mr. T. Moscrop, who dates his communication from the neighbourhood of Farringdon, where he has been engaged in superintending the great improvements effected by Mr. Campbell, the present proprietor of Buscot Park. An inevitable comparison will at once be drawn between the preferred essay of the Society and the rejected addresses of other competitors, as already published, and not, we fear, altogether in favour of the anonymous authorities committed to this decision. Not but that the prize-paper is nicely written, if it wants something of the practical strength and precept of its discomfited opponents; while it has, on the other hand, the advantage of being based upon the most successful system of the day. "Our experience," says the writer, "has been confined to cultivation with a Fowler's twelve-horse-power engine and balance power, and consequently our remarks and deductions are entirely confined to, and drawn from, that experience." If we remember aright, the offer of this premium has thus elicited an essay detailing the results arrived at under each of the three great rival plans in practice, but with Fowler still in the ascendant. Mr. Algernon Clarke, however, goes to combine, or rather to give at one view, the results achieved by Fowler, Howard, and Smith, in his *FIVE YEARS' PROGRESS OF STEAM CULTIVATION*, taking up the wondrous tale where he left it in 1858, and pointing his paper by the performances he was witness to at Worcester. Extending to close upon sixty pages the article is extraordinary for the research and comparative power bestowed upon its composition; the several tables of work, expedition, and economy are of themselves very valuable "studies," although the writer has by no means expended his strength upon their construction. There is not, in fact, a phase of his subject, or a project in trial, but that has full and fair notice in this five years' history, emphasised as every feature is by that grand consideration of its applicability to farm practice. Mr. Clarke's summing-up may be read as, in some degree, a report of the Worcester trials, although these are officially spoken to by the four

judges—Messrs. W. Owen, H. B. Caldwell, Clare Sewell Read, and Jacob Wilson—who all duly sign their report, although this is understood to have been prepared by Mr. Wilson. *THE RESULTS OF STEAM CULTIVATION* as here arrived at are not set very highly: "In conclusion, we would remark that there does not seem to be any marked improvement in the steam cultivators exhibited at Worcester over those exhibited at Leeds in 1861. The apparatus of Messrs. Fowler and Howard, with the exception of some increase in simplicity, appear identically the same as then. Mr. Smith's cultivator, however, was not tried at Leeds, and was, therefore, a comparative novelty in competition, though it is extensively employed throughout the country. The systems of Messrs. Steevens and Coleman yet require further development, whilst the implements themselves need strengthening in some of their parts, so as to adapt them for general use; whilst, despite of the economical application of steam-power to the cultivation of the soil in the case of Messrs. Savory's system, there is great room for improvement in the manufacture and finish of their engines." Still it is encouraging to hear that "steam-power has now been fairly launched as part of the system of the agriculture of this country, and that it can be economically and satisfactorily applied to the thorough cultivation of our soil must be fairly established to the satisfaction of the most fastidious." The report goes on to suggest that "a much more *lengthened* and *extensive* trial of steam-cultivators should in future be instituted, on which such conclusions may be based as may be of service to the public." It is only fair to add, in commentary upon this suggestion, that in the face of his continued success, *longer* and *fuller* trials have ever been the prayer and petition of Mr. Fowler, as well as of his opponents. Nothing could be more becoming than the preferring of such a request, the more particularly, perhaps, from a disappointed competitor, and nothing less so than the policy pursued after Worcester, where one exhibitor refused the second prize because he did not win the first, and another the third because he could not have the second! The judges of steam-engines, of thrashing-machines, of winnowing-machines, and other implements put upon competitive trial, also supply reports of all they did, and with their several signatures attached to the papers here given upon their authority. With a curious lack of method and consistency, however, the judges of stock again carefully withhold any individual responsibility, and report as "one of the judges," as "two of the judges," and so forth. Whatever individual identity may have to answer for, we will not stay here to consider; but it is very certain that the real value and force of the Report of the Stewards of Stock centre on such papers as have the signatures of the writers appended. Professor Varnell, the substance of whose report we have already given, introduces himself very favourably in his observations on the soundness of the horses, and the advantages traceable to the preliminary examination. Professor Simonds speaks as encouragingly on the health of the stock, and boldly out against the Yorkshire bacon "nobbles," who strove in vain to delude the Professor from one of his pet studies—a pig's mouth. Still, it is to Mr. Dent, the steward of the sheep and pig section, that the thanks of the members of the Society will be specially due, for the force with which he writes and the

ability with which he advises and suggests. Here, for instance, is an abuse that we have for years complained of, but that which the Council have evinced a strange timidity in correcting. "The more I saw of the show," says Mr. Dent, "the more I felt that the Society should try to grapple with the shearing question. This year was the first in which I was admitted to the mysteries of the toilette of the sheep, and certainly no young lady going to a Drawing-Room could have more pains bestowed on her than had some of the rams. The clipping and trimming during Friday and Saturday was incessant, and resulted in some charming models of symmetry. How far the carcase would correspond with its outer garment better judges than myself can decide; but, whilst fat overloads and injures our shorthorns and other horned stock on the one hand, on the other the sheep has not only fat, but wool of an indefinite age to disguise his deficiencies and heighten his graces. I should think that many of the sheep had never been truly and fairly shorn; and this was more especially the case, as it seemed to me, in the Oxfordshire Down classes; and I could not help regretting that the close-shorn well-framed sheep of Mr. Charles Howard were not thought good enough for a prize. This delusive shearing belongs more or less to every class, many of the Cotswolds and Shropshires being glaringly conspicuous. The Shropshire and Oxfordshire Downs, though thoroughly useful sheep, have not got that degree of uniformity which makes judging easy, and until there is more fixity of type complaints are sure to arise as to judging. The judges, on

the present occasion, seem to have gone mainly for size, and, I was assured by some Shropshire breeders, had mistaken the type." How capital all this is, and how much good it must do, or is already doing! There is not a word but is warranted even down to the judging of the Shropshire sheep—known, as we said at the time, to be fearfully wrong, and proved to be so by the sales and lettings of the autumn. And Mr. Dent, moreover, is a new man as a Steward, and very fortunate for the Society that he is so. One of the old three-times-Lord-Mayor breed would never have seen these abuses, or, if he did, would have had his ears cut off before he could have dared to denounce them. What a pity it is that so good a man like Mr. Pain could not say something for himself of the horse-show. "One of the Judges" certainly impresses what will be a very popular proceeding when he says, "It will in my judgment be very desirable for this Society to have separate classes for milk-producing breeds of cattle, and especially for the breeds of the Channel Islands, which are becoming much sought after and appreciated." An excellent suggestion this, no doubt, and one strongly called for, as the great neglect of the Society has been with regard to the production of milk; but why a man in office should be afraid or ashamed to strengthen such a recommendation with his name is almost beyond belief! There is not a line in the number, with the sole exception of the matter supplied by the judges of stock, but that has the authority of the author's name for its insertion. The other papers will call for more consideration than we give them here.

THE BREEDING OF RIDING HORSES, AS A NATIONAL QUESTION.

Although the steam-horse may be gradually driving the other before him, the one occupies an equally important place with the other in the new number of the Royal Agricultural Society's *Journal*. The very Part opens with a paper on breeding horses, while a prize essay is devoted to the same subject, and the reports of the judges follow in due course. It is, indeed, very satisfactory to see the attention now called by our leading agricultural associations to so national a question, as this undoubtedly must be considered. The West of England Society led the way in the spring with the introduction of two handsome offers in their prize sheet for thoroughbred and cart stallions, backed by a couple of articles on these several sections in the next number of their *Journal*. Then the Highland Society of Scotland, another of our oldest institutions, has given in this same year, and for the first time during its lengthy career, a liberal prize for a thoroughbred horse; while, within the last few weeks, a Committee has been appointed by the Royal Agricultural Society of Ireland to inquire into the breeding of horses in the sister-kingdom. These different essays and investigations may be said to include every breed and kind of horse, though the interest of the occasion has rather centred on the supply of hacks and hunters, as a branch of the business hitherto much-neglected, alike by the farmer himself as by his advisers. The heavy draught horse has, in truth, never been without his place at our great meetings, whereas it is only within the last two or three years that the saddle horse has taken any part in the proceedings. The aim has, consequently, been to create more interest in this matter, with all the more reason for doing so, as good horses are known to be getting scarcer and scarcer, and thus the prize essay of the Royal Society turns on the breeding of hunters and roadsters. Written especially for the use of agriculturists, and

appearing in an agricultural organ, we can only regret that the selected paper is not of a more practical character or direct tendency. As has already been written of Mr. Gamgee's article, it is a deal too "bookish," going back at an unnecessary length into the history of the horse, and clogged with whole pages of padding, such as the tedious dissertation on "the physiology of progression," that we much fear will go far to prevent it ever being read by those to whom above all others the essay should have been addressed. The suggestions for any absolute improvement in the practice of breeding hunters and roadsters by farmers are very few and very vague, and about Mr. Gamgee's chief point is a tolerably strong condemnation of all the English Society has done in this way. Thus "no good end is likely to result" from the establishment of the £100 premium for a thoroughbred horse, unless, as the writer recommends, the offer be coupled with all sorts of restrictive conditions—utterly incompatible with the principle of a great national gathering. Again, "the whole system of awarding prizes to stallions" is objected to on grounds almost entirely without any due foundation; such as, for instance, that three and four-year-olds generally win these premiums, that these horses go abroad so soon as they have won, and so forth. We only share in a pretty general disappointment at so little coming in answer to the offer of the *Journal* Committee, while we can scarcely refrain from doubting but that something more useful might have been found amongst the rejected addresses. It is only to be hoped that the Council will never be tempted to act on the advice of their essayist, or they will only be undoing all they have been doing in the right direction during the last three or four seasons. Mr. Dickenson's letter to the Speaker of the House of Commons "On the Breeding of Horses," is much more to

the purpose, and there is, in fact, a deal of good in it. From having been for many years in business as an extensive job master in the metropolis, Mr. Dickenson, who has since taken very enthusiastically to farming, may be regarded perhaps more as an authority upon horses for the collar rather than those for the saddle. He writes well, however, upon either branch of his theme, and his remarks upon the soil and stable are those of a thinking man, whose notions have been tested by continual experience. Blood, of course, is his grand recipe for restoring the riding-horse—"there is no substitute for blood," although from the abuse of our young things in the racing stables, a really clever, useful thorough-bred horse, fit for country service, is often a difficult thing to meet with. Mr. Dickenson goes for the re-establishment of heavy-weight plates on the course; while "the Agricultural Societies of the United Kingdom should follow on with the Royal Agricultural Society, and call for weight-carrying thorough-bred stallions; with prizes for these horses, as though they were of equal importance with cattle, sheep, and pigs; prizes should be given for thorough-bred horses of three, four, five years, and aged horses. Prizes for geldings seem to me to be unnecessary, and can have no effect upon the object required."

So says Mr. Dickenson at the invitation of the Right Honourable John Evelyn Denison, in the pages of the Royal Agricultural Society's *Journal*. And yet how doctors differ! At the last meeting of the Council of the Bath and West of England Society, Lord Portsmouth, who was in the chair, said: "Nothing could have been a greater failure than the exhibition of horses for riding purposes at Exeter, and he was strongly of opinion that they ought not to give prizes at all for thorough-bred stallions, but to give good prizes for results. With this view he recommended a prize for four years old hunting colts, an age at which it was easy to judge of a horse's character and qualities. The truth was, the owners of first class stallions would not show them at all, let them offer whatever prize they might, and he would remind them that though the stock got by a celebrated winner of the Derby (named) fetched a high figure as yearlings, they had greatly disappointed expectation." Here we have a positive recommendation, and one upon which the meeting appeared inclined to act, that no prize should ever be given for a thorough-bred stallion! It still may be well to follow out the reasons offered in support of so singular a suggestion. In the first place, was the experiment tried at Exeter so immense a "failure," as his lordship would have us believe? On the other hand, was not the winner, Ratan, well-bred, good-looking, and the sire of some very promising hunting stock? Or further, to test this yet closer, has Lord Portsmouth in his large stud a race-horse with a better character than one or two of those exhibited at Exeter? Ratan, that with fair play, as many good judges still think, could have won the Derby? Or Hungerford, a really stout horse, that ran better and longer than nineteen out of twenty of the animals that Lord Portsmouth brings out? Again, as his lordship maintains, the owners of good stallions will not show them. But is it so? We have seen Voltigeur on the show-ground; good thorough-bred stallions are entered year after year in Yorkshire; while at the Royal Worcester Show this summer the judges commended every horse in the thorough-bred class, at Battersea in the year previous a Derby winner took the first prize, and at Leeds for the first offer there was some equally encouraging support from the owners of good horses. In direct opposition to Lord Portsmouth's opinion we must maintain that the Exeter spring show, as a first experiment, was by no means a failure, and further, that the owners of good

thorough stallions will show them still, as they have sent them to meetings where the presence of such stock is properly appreciated. Just look to the experience of Captain Croker, for some time Secretary of the Royal Agricultural Society of Ireland, and who himself started the Croker Challenge Cup for the best thorough-bred stallion. Within the week or two Captain Croker writes thus in the *Irish Farmers' Gazette*:—"You cannot but remember the society's meeting at Waterford. At it was exhibited the largest and best show of thorough-bred stallions ever brought together either in England or Ireland. How was this effected? Because I collected, with much individual exertion, a sum of £130, which enabled me, as secretary to the Society, to offer £50 for the best weight-carrying thorough-bred stallion; £30 to the second best; £20 to the third best; £20 to the best brood mare for hunting purposes; £10 to the second best. I have not a copy of the Waterford catalogue; but so well as my memory serves, upwards of forty thorough-bred stallions were exhibited, and seventeen brood mares. You have attributed to me the right motive I had in presenting to the Society 'the Croker Cup,' but I had a further object in view. I wished those challenge cups should be an incentive to the Council, sufficiently strong so as to induce them to add to the cups substantial money prizes. It is not too late; let a yearly grant of at least £150 be made for the thorough-bred horse class. If this be done, I will venture to say we shall not have to complain of the wretched class of horses which have been exhibited." As a practical authority, as himself a good sportsman and a breeder of thorough-bred stock, as well as an exhibitor at and director of agricultural meetings, we need scarcely say that Captain Croker's opinion on such a subject is infinitely preferable to that of Lord Portsmouth. The latter, however, goes on to remind the Council of the Bath and West of England Society that "though the stock got by a celebrated winner of the Derby (named) fetched a high figure as yearlings, they had greatly disappointed expectation." Very possibly; but what this had to do with the matter under consideration—that is, a premium for a thorough-bred horse at an Agricultural Exhibition—is really quite beyond our comprehension! We could give his Lordship the names of a dozen celebrated winners whose stock, though sold at high prices, had greatly disappointed expectation. But what then? Where's the point of the story? Surely if there ever was a non-sequitur it was Lord Portsmouth's Derby winner at Taunton! Still, astounding as it may sound, the Council would seem to have been at once convinced of the uselessness of offering any prize whatever for a thorough-bred stallion; and so, further down, we find that at Bristol there shall be "in the horse classes prizes of £30 and £15 for agricultural stallions; £30 and £10 for the best hunting mare and gelding, 4 years old; £20 and £10 for carriage horses, and £10 and £5 for galloways, not over 14½ hands. But this list, as we are informed, is still subject to "future modification"—to be modified, as we do trust for the good sense of the society, by the re-institution of the £50 premium for the best thorough-bred stallion to get sound and stout stock. How are the farmers to grow their prize four-year-old hunters without the thorough-bred stallion to begin from? Or, why a prize for a cart stallion, and not for a thorough-bred? There is an utter abnegation of all principle in the course about to be adopted by the West of England Society. Is it a show for encouraging the best breeds of animals, or not? If it is, the Council might as consistently have classes for steers and none for bulls, after they have once committed themselves to the monstrous absurdity of Lord Portsmouth's proposition.

SMUT IN WHEAT.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—I learn from your last week's publication a "Novice" wishes to know the cause and how to prevent smut occurring in wheat, and as this is about the season when our attention is particularly drawn to this subject, perhaps a few remarks of mine may not be amiss, and find a place in your valuable and widely circulating columns. By the term "smut" I infer *Uredo foetida*, or Bunt, is meant—a fungus disease affecting the grain only, of very common occurrence in badly-farmed districts, where little care is taken in procuring good seed, and omitting to dress or pickle the same. On examining the grains affected we find the starch and gluten displaced by a black disgusting fetid powder, reminding one of the odour of putrid fish. This powder is a mass of very minute spores; their size may be easily imagined when we are told that one single grain is capable of containing four millions of those sporules, which are of a greasy oily nature, that causes them to adhere to the surface of the sound grains, when by chance an affected grain bursts, which a great number do during the process of threshing and cleaning for market. The diseased ears may be easily detected at harvest by a dark greenish tint, which is seen through the glume or inner chaff scale, but more easily observed after threshing by the same tint of the grains, which makes them assume a dull appearance. They are also fuller and rounder than the healthy grains, and void of that golden hue which characterizes a good marketable sample. To detect the affected ears it may require a little experience, but when once the eye becomes accustomed to them they can be detected in the standing corn with little difficulty, and selected from the healthy ones with the utmost certainty. They are generally a little below the average height of the sound ones. I remember a few years since seeing a piece of wheat so badly affected by this disease, that by merely looking over the wall surrounding it dozens of those affected ears could be easily observed; and I have no hesitation in stating that a tithe part (tenth) of the value of this crop was sacrificed, notwithstanding the local method of pickling the wheat before sowing was resorted to; but one precaution was neglected, which we shall mention as we proceed. Those spores adhering to the sound grains at the time of sowing remain in that state till the young plant starts its growth, when they are supposed to enter the spongioles of the roots of the young plant, and with the ascending sap are propelled through the tissues of the plant till they reach the young ovum, where they find a suitable place for vegetation, rendering fecundation impossible; yet the grains continue to swell, and when harvest comes they are perhaps larger than the healthy ones, and curiously enough the stigmata of the flowers are not destroyed. As before observed, during the process of threshing, cleaning, &c., the "bunt" seeds are ruptured, and the cloud of sporules then escapes, which adhere to the testa of the sound grains; and if they be sown in this condition the result may be easily predicted. The basis of all pickling or dressing consists in converting the greasy oily sporules which adhere to the sound grains into a soap, which facilitates their removal. Here chemistry lends her aid by informing us alkalies possess those properties, and whatever ingredient is employed, the effective constituent is some alkaline matter in the form of a ley. Lime, urine, &c., possess those properties; and when the former is resorted to, the method is very simple. A sack of wheat is placed on the floor in the form of a conical heap, flattened and concave on the top; a lump or two of lime are then thrown into a bucket, and a gallon or six quarts of boiling

or cold water added. A rapid ebullition ensues; during which time it should be well stirred, to ensure a perfect slaking of the lime. In this state it is thrown into the concave top of the conical heap of wheat, and well mixed with a shovel till all the grains appear to have come in contact with the lime, and then left for a few hours; when it will be dry enough for drilling. This method of dressing is generally done over-night, and left in a neat conical heap (which the *superstitious old farmer used to cross with the "besom," the handle of which was thrust into the cross*) till the morning. This eccentric method was adopted with the belief that it kept the *witch* from executing her evil designs. When urine is resorted to for pickling, it should be kept in a tub for a few days prior to using it, as fresh urine, voided from healthy subjects, possesses an acid reaction instead of an alkaline, which it only acquires by keeping a short time. The *urea*, a nitrogenous compound in *urine*, takes up four equivalents of water, and becomes converted into two equivalents of carbonate of ammonia—"smelling salts" of the chemist—giving the whole an alkaline reaction: a condition which is necessary to ensure the removal of the smut-balls. The piece of wheat, to which I alluded above, was dipped into *fresh urine*, the manipulator not being aware of the fact that it became more efficacious in removing the sporules from his infested grains after it had undergone this simple and interesting change.

Where urine is used, the wheat may be dipped into it; or the former may be poured over the latter in sufficient quantity to well moisten the whole.

Another agent, which is commonly used in pickling wheat, is sulphate of copper (blue vitriol), in the following manner: 4lbs. of the vitriol should be dissolved in about two gallons of boiling water, and when fully dissolved placed in a large tub—an old hogshead cut through the middle answers the purpose very well—and add about 20 gallons of cold water. Procure a wicker basket, of suitable shape to go into the tub, large and strong enough to hold a bushel and a-half of wheat. Place the basket in the liquid, and gently pour into it the wheat. By adopting this precaution the light and imperfect grains, chaff, or small seed will float at the top, and may be skimmed off the surface. Having proceeded thus far, lift the basket, and allow it to drain over the tub; empty the same, and proceed with the next lot. This method will be found very convenient as well as effectual; but the most effectual remedy consists in selecting a good, clean, and even sample for seed, from a climate suitable for a change, when each kind of dressing will be found to answer the purpose. I was talking to an old farmer to-day (who had been at it for more than forty years, and he must know "summut" about it), farming over 400 acres for a nobleman—whose crops are everything that can be desired—and he told me that he never resorts to pickling his wheat before sowing, and yet is perfectly free from "smut;" and added, he used to be troubled with it, when he used the vitriol. The fact is, he is more careful in selecting his sample for seed, his land is in better condition than formerly, and his crops are never remaining in that stagnant condition which favours the development of those fungoid diseases. But as the risk is so great and the trouble so little, we cannot but condemn the system of sowing wheat without taking the necessary precautions to prevent the spread of the disease.

W. H. H.

(Member of the Royal College of Agriculture).
Gloucestershire, Oct. 14, 1863.

STEAM DIGGERS AND DELVERS.

That spade husbandry as practised by gardeners is a superior system of cultivating land to ploughing with horses as now followed by farmers, is an old-established conclusion in the minds of all horticulturists and agriculturists qualified to sit in judgment on the subject. Such being the facts of the case, it would be superfluous to enter upon the details of the exhausted controversy of the plough *versus* the spade, so far as the quality of the work of cultivation is concerned.

Having recently admitted the superiority of spade-husbandry in contrast with plough-husbandry, we were immediately accosted by more than one interrogatory why we were limiting the mechanical genius of steam to the tugging-tail-draggle of an old worn-out horse? thereby sacrificing a fundamental principle in the cultivation of land; acknowledging ourselves baffled in teaching steam to handle the spade and fork successfully in the field; raising an old-exploded system as a new superstructure on the ruins of our discomfiture, and so forth.

All this is, doubtless, very plausible in the form of farming "table-talk." If steam has been taught to perform, with a dexterity and gentleness far surpassing the muscular talents of the superior extremities of man, the numberless nice manipulations of art, as exemplified in all our "busy hives of industry," true enough the natural conclusion forces itself upon our notice—that by the exercise of a little patience, perseverance, and ingenuity steam will also ultimately perform its wonders in the field, in digging land to the satisfaction of both gardeners and farmers.

As impossibilities have long since been discarded from the physical world, the above conclusion may therefore safely be conceded, subject to the casualties of the future. Hitherto one of the cardinal difficulties experienced has been the solution of the question as to whether the spade or fork should be placed on the periphery of a revolving axis, wheel, or drum, or into the hands of a mechanical rustic having a reciprocating automatic turn-spit action, resembling as nearly as possible a well-trained delver.

We have here two kinds of steam-cultivators, the one distinct from the other both as to mechanism and method of cultivation or quality of work performed. And as numerous experiments have been made to reduce both propositions successfully to practice, we shall examine their merits and shortcomings separately, confining our observations to the former in our present paper, viz., the rotary system of steam-digging.

In the publications of the Patent-office on steam-culture, we find no fewer than fifty-three "abridgments of specifications" of "revolving harrows, cultivators, diggers, and clod-crushers," up to the close of 1856. And since then several new propositions have been yearly added to the list, so that anything approaching to a notice of the merits and shortcomings of each implement individually is out of the question. With Hoskyns's, Romaine's, and Samuelson's diggers our readers, it may be taken for granted, are familiar; and these, reversing the alphabetical order in which they are given, for the sake of discussion, will suffice to illustrate the principles of mechanism of the whole iron race of STEAM-DIGGERS, so far as is necessary for our purpose.

Samuelson's digger is in principle simply an improvement of the spiked roller of the olden time; and although the examples best known are constructed for being hauled by horses, yet the above-named digger has

also been hauled by steam, while several of the above patents include similar machines for being actuated exclusively by steam-power. Implements of this kind have been in use from time immemorial, partly for breaking clods, and partly for cultivating to a small depth, and raising a fine surface-mould for turnip, clover, and similar small seeds that require a finely-pulverized soil. That which chiefly characterizes the mechanism of the example under notice, is its consisting of a series of discs having their peripheries armed with long curved teeth, the points being turned downwards sufficiently far to touch the surface a considerable distance in front of the axis, so that the forking apparatus enters the ground partly by the force of traction, and partly by the weight of the whole implement which admits of being loaded according to the nature of the soil. The advantages gained by this curvature of the forking prongs are, however, more apparent than real, as will immediately be seen from the sequel.

A detailed description of the peculiar mechanism of this class of diggers is unnecessary. Their shortcomings or mechanical defects are many, while their merits are few, and soon told. Superficially examined, the work they make in autumn or spring-time is sometimes very promising; but the moment you drive your foot into it, and begin to investigate the state of things below the surface, it is otherwise, especially if the soil is of a clayey character, and possesses a considerable degree of tenacity below, as is generally the case in early spring. Thus the frost during the winter months may have penetrated two or three inches, leaving a fine surface mould to this depth; but the staple below this finely disintegrated stratum on the top, owing to its affinity for moisture, is one coherent mass often up to a late period of the season; so that when the digger enters it in such a state, purposely to effect its aëration, and reduce it to what is known amongst practical men as "between the wet and the dry," it does much more harm than good. The curved forking prongs may penetrate to the depth of a foot, and with the chisel-edged points bring up small portions of wet clay; and these they may leave on the surface, giving the whole a very favourable but deceptive appearance behind. Unfortunately, however, from the cycloidal action of the curved teeth, they do not loosen the soil below, but, on the contrary, greatly consolidate it; for the convex part of the tines runs or cuts into the wet tenacious clay in front, while the points rise up in the open runs thus formed behind, without producing any loosening effect on the intervening soil. And even in fine dry seasons, when the farmer is not obliged to send the digger to the field before the bottom staple is in a favourable state for working, the action of the diggers is not rotary; thereby loosening the whole of the soil as they advance, but resembling the bad work performed by a lazy workman with a pick, who only makes here a dab and there a dab, as if afraid of hurting the face of old mother Earth!

It is very evident that something is radically wrong with the principle on which such machines are calculated to cultivate land—something that is equally faulty in the mechanism as in its *modus operandi*. Thus it is equally manifest that the work performed by the old spiked-roller and our modern clod-crushers (as Crosskill's) involves both sound practice and sound principles as to mechanism; so that in the improvement of the latter we have fallen, somehow or another, into a radical error, that must be

removed before they can be of any lasting use in steam culture.

The error just referred to, in the preceding paragraph, is obviously a precipitant jump in the dark from the shallow surface consolidating culture of the spiked-roller and clod-crusher, to the deep, bottom-aërating work of subsoil-cultivators, without calculating the cycloidal and gravitating properties of rotary diggers of the kind in question. Had the former been constructed on erroneous mechanical principles like the latter, both might have been shelved instantaneously, or disposed of as old iron to some mendicant broker in this department of commerce, so that we should not have been justified in discussing the subject either one way or another. But the very reverse of this being true, shallow consolidating surface culture being often an imperative requirement of successful practice, the *pros* and *cons* of the case call for a thorough investigation; and the discussion is tenfold more loudly demanded under steam than it was under horse-culture, for implements of this class can be profitably worked by the former, when the feet of horses would sink, pit, and ruin the land. Thus in open, mild winters, like the past, when there has been no frost to pulverize the surface of tenacious clayey soils, or in wet late spring seasons, when such soils are still more liable to crack and bake into bricks before they will carry the horses' feet, a finely pulverized surface-soil may be easily raised by steam-hauled implements, so as effectually to prevent the ruinous loss so frequently experienced under the old system of traction. Such then being the facts of the case, it behoves us to reconsider the untimely jump we have made from sound principles of mechanism to those of a contrary character.

The mechanical question at issue (perhaps we might have called it with equal truth, in reference to the past, a mechanical paradox) resolves itself into that of *two antagonistic forces—gravitation and traction*, hurrying each its own way adversely to the direction of the other, but both to the common field of battle, to break our clods and pulverize our brick-baken surface soils.

There is something so singularly unique in the *modus operandi* of the above two forces, in the cultivation of land, as to call for close consideration, now that we are substituting the more elastic energies of steam for the muscular powers of the horse or ox, lest we overlook differences between the two prime movers, that are calculated to produce a corresponding diversity of results. Thus, it is a well-known fact to farmers, that horses are more slow in their movements than their more elastic rival, and more accommodating to the many obstructions met with in the soil, for they learn by experience to "hang in the collar," as it is sometimes technically termed, when the implement comes against a stone or any obstruction that calls for an extra amount of muscular power to overcome it, whereas steam moves on at a more lively and uniform pace without paying any attention to obstructions. Such being the differences on the one side, the question naturally arises for solution as to what the results are on the other.

If we take an extreme hypothesis, and suppose the implement moving at a greater velocity than that due to its gravitation, as exemplified in a shell or ball when fired from a piece of ordnance, then the digging apparatus would not enter the ground at all. In experience there are many familiar illustrations of this kind, not so far from the point as the extreme case of a bullet from a gun. Thus, in skating upon ice too weak to support a person when standing, or in walking over a live bog or muddy seashore, the faster we move the less liable are we to sink; and just so is it with rotary diggers of the kind under examination, so that the faster the team or wire-rope moves, the less effective are they in the field, and the worse will be the quality of the work performed.

A very interesting illustration of this kind came under our notice the other day, and to which representatives of two of our largest agricultural implement firms were also eye-witnesses. An attempt is now being made to loosen the surface of the streets of the metropolis prior to putting on fresh metal, by means of spiked-rollers, diggers, or by having the tires of cart or waggon-wheels thickly armed with strong teeth. On the day in question, a waggon heavily loaded with metal or broken stones, and hauled by four fine horses, the wheels being armed as above, was proceeding down the incline from Westminster Bridge, on the Surrey side. When standing, the teeth entered but a very short distance into the hard road; when the wheels moved slowly with a partial jolting action, in passing over fast stones, a greater loosening effect was produced; but when the whip was applied, and the horses moved off at a more rapid pace than it was probably intended they should have done, then the action of the teeth upon the road was hardly observable in some places. One of the gentlemen above referred to saluted us on the occasion with the timely interrogatory to this effect—as to whether the example did not furnish a useful practical lesson; and here we give the readers of the *Mark Lane Express* generally the full benefit of the instruction which it conveys, as to the antagonistic action of the two forces (gravity and traction) under consideration, in working rotary diggers, clod-crushers, &c., &c., either by horses or steam.

The practical lesson taught by the preceding examples is briefly this: Rotary diggers forced into the ground by their own weight should be hauled at a slow pace to produce the greatest effect. However slowly they may move the points of the teeth, instead of entering the soil in the most profitable direction, they can be driven as wedges—i. e., in a direct line with their axes, as nails are driven by a hammer, or as a hatchet or other sharp-edged instrument is driven into wood—they enter less or more sideways, impinging against the earth in front, parabolically from the vertical and horizontal lines, which may be taken as the lineal direction of the two forces; so that when the speed is increased to a rapid pace, the momentum of the implement forces the flat sides of the chisel-edged teeth more and more against the flinty, stony, or baken earth in front, thereby consolidating instead of loosening it behind. Scientifically expressed, the effect produced by gravitation, or the attraction of the earth, is directly as the times, but inversely as the velocity of the implement; but into data of this kind we shall not enter. The above may be practically expressed, as a rule, thus: Give the implement time to sink its teeth the proper depth into the ground, before you proceed further.

The impossibility of effecting deep cultivation by this class of rotary diggers arises from the cycloidal line of action of the working parts. In shallow surface culture the same line of action is described by the points of the digging apparatus; but the adverse retarding opposition presented by the soil in the two cases is very different. In the latter, very little resistance in front is experienced by the parts of the digging prongs below the surface. In neither case is there any lifting up loosening action behind. This arises from the characteristic properties of the cycloid; for as the points begin to rise upwards, they at the same time also begin to move forwards, the cycloidal curve being produced by the line described by each point as it thus rises and moves forward behind, and falls and moves forward in front. But in the former case—deep culture, when the diggers sink in the soil to nearly their full length—it is otherwise, for then the generating circle begins to plough, or rather rut, like a cart-wheel up to the naves in soft land, so that the upheaval may be more easily imagined than mechanically described. A more objectionable system of culture could hardly be devised, for it approaches

closely in principle to what is experienced by carting when the wheels of the carts and the feet of the horses both sink and poach the land; and our practical readers require no argument to convince them of the ruinous results of such a practice. In every respect the effects produced are the very reverse of what good husbandry requires, no kinds of soil forming an exception to this conclusion.

There is a wide difference between the proposition of Romaine and Hoskyn, which we have now to examine, when compared with that noticed in the foregoing. In examples of the kind now before us, the rotary cultivator moves at a greater velocity than the onward progression of the carriage in which it works, consequently the whole of the earth may be loosened to any given depth, and thrown up behind in any degree of pulverization required. It involves a method of applying steam-power that has long been considered by many the only one that harmonizes with sound principles of mechanism and perfect culture. Indeed, for some time after the publication of "The Chronicles of a Clay Farm" it was the only system that the vast majority of farmers would under any consideration, countenance. Unfortunately, however, the true mechanical Talpa soon came to grief; and a different conclusion can hardly be arrived at relative to the other example. And so changed has public opinion become, that possibly the majority of our readers at the present day may think the system unworthy of a serious consideration. But this is manifestly a hasty conclusion, prematurely arrived at, as can readily be proved; for, granting, as we readily do, that the rotary system can never enter into general competition with the rectilinear action of the plough or the turn-spit system of digging, which we shall subsequently notice, there are nevertheless thousands of cases where it would be preferable to the former (the plough), provided its mechanical defects can be removed, so as to bring it successfully into the field. In point of fact, therefore, the real question raised for discussion is not the merits of either of the above diggers, but the short-comings of their race, with a view to get more perfect implements of the kind brought into the field to perform the peculiar work for which they are best adapted. Such being the question whose merits we have been solicited to discuss, as formerly mentioned, all objections and prejudices to the contrary consequently fall to the ground; while on the other hand, if we cannot benefit those of our readers specially interested in the subject, they will at least give us credit for the best intentions.

One of the chief defects of rotary diggers of this class arises from the two adverse forces of the working parts being such as greatly to counteract each other, thereby to a corresponding extent neutralizing both.

The former of these forces is that due to the progression of the engine and carriage that carries the digger behind in travelling along the surface of the ground, and therefore, properly speaking, the line of direction may be termed horizontal, although scientifically and practically this is not exactly true, as we shall subsequently have to show when examining the details of mechanism; and the latter force is that due to the diggers, and its direction is curvilinear, crossing the horizontal path of the former.

The reader will thus perceive that we have again got amongst what may not be inaptly termed "the cross purposes" of rotary action, to avoid which will be found no easy task. Thus, if we suppose the diggers take on each an inch or two inches of fresh ground every cut, then while one digger is describing its section of the circle, let it be a quadrant or octant, or what you like, clearing away the solid land in front, and talpa-like working the loose earth backwards to the rear, thereby performing its work so as to make room for the next, the second digger is being carried forward by the horizontal force an inch or two inches, as the case may be, so as to

bring it into position for action. And so on with the other diggers on the periphery of the drum as it revolves, until the first digger again comes round into position. But while the second digger is being thus brought forward for action, the first digger at work stands in the way, and consequently it has to be hauled forward an inch or two inches horizontally across its natural path into the solid land, thereby acting as an anchor; every successive digger as it advances to work experiences a similar anchoring opposition from the one at work immediately before it. Hence the practical reason why the engine and diggers come to a dead lock when the latter come in contact with stones or meet with any obstructions, so that the sum of the anchorages and other cross purpose resistances exceed in magnitude, if we may so speak, that of the motive power, steam.

Two plans have been adopted to obviate the anchoring process of the diggers at work, to the progression of those advancing horizontally to rotary action in turn; but both, it need hardly be said, have proved failures. The first is, to increase the velocity of the diggers, and reduce the time of action in work; and the second, to increase the diameter of the revolving barrel and the curve described by the points of the diggers, or the distance between the points of the diggers on two opposite sides of the axle, or, more popularly expressed, by increasing the size of the diggers, so as to bring the curve they describe nearer to, or more closely into, the horizontal line of progression, thereby reducing the anchorage to a minimum degree of resistance.

Of these two plans, the latter is the only one that merits a detailed notice; for if you increase the velocity of rotary action, according to the former, you must also at the same time increase the velocity of progression so as to take in the proper breadth of a cut of fresh ground; for the times in the one case must be equal to the times in the other, unless we introduce the theory of diminishing the number of the diggers, and increasing their velocity in the adverse ratio, so as to procure a lapse of time, as it were; but even under this speculative proposition, the advantage gained during the lapse of time when there is no anchorage does not compensate for the greater sacrifice made during the half or quarter-time of anchorage, as the case may be, that arises from the greater velocity and its consequences.

As to the other plan, of a larger-sized digger, it indirectly amounts, the reader will perceive, to a fair confession in favour of the rectilinear and horizontal action of the plough, as the nearer the curve-line of the former approaches to the rectilinear path of the latter, so much the better; while equal, if not greater, anchoring opposition is incurred than what has been avoided. In other words, the losses are greater than the gains.

The losses thus sustained are of two kinds. The first has reference to the greater amount of resistance experienced by the diggers, from the increased length of the curve they describe when in action in the soil; and the second involving the increasing anchoring resistance experienced from the adverse fulcral action of the compound system of levers in operation. The two thus call for a separate notice.

In digging with a spade or fork, the closer a deliver stands to his work, and the more perpendicular he drives his implement with his foot into the ground, the less the expenditure of muscular power in the performance of the work. And the practical data involved in this case is equally applicable to that of the steam-digger under notice. Soils possess certain degrees of hardness and cohesion, and these present to the edge or mouth of the spade a corresponding amount of resistance which has to be overcome; and to such must be added the friction experienced on the blade or body of the spade or prongs of the dig-

ging fork. And the sharper the edge and smoother the surface of the spade or fork, the easier is it driven into the land, and the more readily does it part with the spit when thrown from it. Now, such being the facts of the case from a general point of view, it will readily be perceived that the difference in the amount of resistance experienced between a short vertical spit and a long diagonal one may be represented, the former by the perpendicular, and the latter by the diagonal or hypotenuse; and if we assume that the amount of resistance is directly as the length of the curved spit of the steam-digger, which may safely be taken as an approximate estimate for the generality of soils, then the loss sustained by increasing the size of the digger, so as to lengthen and flatten, as it were, the curve, will be readily understood.

As an offset to this, the talpaian theory of abrasion may, perhaps, be advanced. And in sun-baked clays, comparatively free from stones, clawing it down by an eighth of an inch or so at a time is very attractive to those only accustomed to "light reading"; but unfortunately, when we come to the stubborn realities of practice, eight-eighths make an inch, so that the sum of the anchorages are exactly what they were in the other case, while the friction and resistance generally arising from the increased number of rotary spits are greatly against abrading action.

The second loss arises from mechanical data of a much more complicated character. The numerous wheels, cranks, diggers, &c., of the engine and digging apparatus comprise a system of levers, and every lever in operation must have its own fulcrum. And, as in levers of the first kind, the pressure upon the fulcrum is always equal to twice the power applied, we have first to examine the several fulcra, in order to ascertain whether the pressures upon them are against or in favour of the one or the other of the two forces already mentioned relative to progression and digging, or whether they are divided equally between them. All the levers, however, are not of the first kind, the travelling wheels of the engine, for example, that bear the weights of their loaded axles, being endless levers of the second kind, the ground under them being the fulcrum; and this is true of all wheels that roll upon the ground or any supporting surface. But, when the axle has to bear the weight of the wheel, and not the wheel the weight of the axle, it is otherwise, the leverage being then generally of the first kind; but sometimes, of the second and third, according to the part of the wheel or circle to which the power is applied in relation to the part of the wheel that overcomes the resistance. Thus, if the power is applied to one end of the diameter, so to speak, and the resistance or weight is at the other, the leverage is that of the first kind, and the pressure upon the fulcrum equal to the power and weight. The same is true when the two radii to which the power and weight are applied form a quadrant, the lever being then a bent lever; but when the angle of the bent lever becomes less than a right angle in wheel work, the power is then applied either between the fulcrum and the weight, or the weight is between the fulcrum and the power, so that in the former the leverage is of the third kind, and in the latter of the second kind. And, in the construction of rotary diggers, no general rule has been adopted in reference to these fulcral data, so that almost every individual case has to be examined in its own light. At the same time the general conclusion may safely be drawn that the pressures upon the fulcrums and resultant forces are greatly against progress—in some examples more than might be—while, in others, there is a similar loss arising from leverage, the two being quite sufficient to account for the dead locks experienced, before a sufficiency of work, comparatively speaking, has been done in amount such as to account satisfactorily for the break-down. And in both cases the loss increases with the size of the digger,

the elevation of the fulcrum, and direct counteraction of the resultant forces.

There must, therefore, be some interesting difference between the diggers of our natural and artificial talpas that is not yet mechanically understood, otherwise the latter would not be so far behind the former in point of merit and success in the field, as they unquestionably are. We need not wait long for an answer to this, for the digging and progressive movements of our natural talpas are intermittent, while those of our artificial ones are both continuous. Were the sable-subterranean little gentleman squeezed up by a continuous pressure from behind, in the way we squeeze up the noses of our steam-delvers into the solid soil in front when at work, the brisk muscular dexterity of his rotary diggers would become as quickly neutralised as those of his mechanical rivals.

Mechanically speaking, therefore, the solution of the problem may be circumscribed within a very narrow circle—self-elongating diggers, and intermittent progression somehow. The principle of action is as plain as the first three letters of the alphabet, so that all we have to do is its reduction to practice.

The first step in the solution of this problem is, then, to square the circle, so as it may coincide with the peculiar genius of steam as a motive power; and in this it is manifest that intermittent progression must be confined to the digging apparatus, while the steam-horse himself must be allowed to move on at as uniform and uninterrupted a pace as possible, so as to gain the full momentum of his huge weight, and avoid the extra power required to start him from a state of rest instantaneously to the proper speed, so as to give the diggers their effective velocity.

As logic is a totally different thing from mechanical discovery, it follows that argument is unnecessary, either to prove or to unprove how continuous and intermittent motion may be thus conjoined. If we pay a visit to a spinning manufactory we shall see parallel examples of travelling apparatus going to and fro with a clock work regularity that baffles the keenest eye of criticism to find fault with it, only the framing in which the travelling apparatus works is not moving in the wake of the steam-horse; but this is a simple affair, and easily reconciled with the mechanical requirements of the case.

Having got the first idea of a travelling frame falling behind the steam-horse, and then beating up ahead in a sort of endless rack-platform, passing over two wheels as a fulcrum for our levers, we have next to inquire how far the digging apparatus of our artificial talpas differ from that of the natural, and here we find that the latter neither wastes time nor muscular power by working his diggers as "Dominic Sampson" did his arms, like those of a wind-mill, for with his abrading apparatus he only describes a small sector of the circle in loosening the solid earth in front; and when this is done, the loose earth under him is next worked backwards by a totally different operation and movement.

We have here, then, two distinct operations performed by two separate movements, both of them involving economy of power, time, and tear-and-wear of the working parts; and this obviously forms a very instructive lesson as to how we should proceed in the practical solution of that part of our problem now under consideration.

The first work that requires to be done, it thus appears, is the breaking down of the solid earth in front, and the sector movement of talpa's abrading claws, and the rack fulcrum, already noticed, suggest the *ever-lever action* as our next idea in working out our problem.

In conclusion, therefore, can any of our interested readers make the gentle hand of steam work an *ever-lever* in chiselling down the solid earth in front, as a carpenter with a mortising-machine chisels down the more solid and adhesive substance of the wood to any depth required,

thus leaving it comparatively loose below for the next operation, which can easily be performed by light rotary apparatus, that merits no detailed description as to prin-

ciple. So much, then, for the first ideas of a system given impromptu as they occurred to the writer, without any previous premeditation. ENGINEER.

LODDON AND CLAVERING ASSOCIATION.

The meeting of this little agricultural society was held on Friday last at Loddon. For many years the show of stock has been more or less of a success, but the present meeting unhappily showed a decided falling off. This was particularly observable in the horses, and as these Hundreds are rather celebrated for good horse stock, there must be some reason for the deficiencies of the entries. We can only account for it in this wise: A few gentlemen of the neighbourhood have had a little friendly rivalry among themselves, and have, during the last few years, gone to Snffolk and given long prices for the best cart-horses they could find, so that the farmers appear shy of showing against these crack animals with the dead certainty of being beaten. This year, for some whim, or good reason known only to themselves, the nobles entered hardly any horses, and the show was consequently very deficient in that line. Sir Thomas Beauchamp did enter his four-year-old Suffolk stallion, but he was beaten by Mr. Hunt's six-year-old bay, a clean legged well shaped Norfolk horse; while the baronet's more showy Suffolk had small feet, shaky fore legs, and capped hocks.

The Judges did not consider either the cart mares or the foals worthy of the first prizes, and so awarded only the second premium in each class; but there was a goodly muster of two-year-old cart colts, both prizes going to Sir Edmund Bacon for two big, strong, and well-made chesnuts.

The cattle classes were all of them much better filled than the horses. There was a close run with the Short-horn bulls for the prize, the Rev. J. Holmes beating a bull of the Cambridge blood bred from Lord Hill's stock, and which is now the property of Mr. Bachelder. There was much diversity of opinion as to which bull should have been placed first; both were in very poor condition, both had many good points, and both had very many bad ones. Mr. Bachelder's bull has a noble head, a nice horn, with a good touch, mellow hair, and deep forequarters; but he falls off miserably from his shoulders, and though his ribs are round, they are so very short that he has no depth of carcase, and so looks from behind a leggy and tucked-up beast. Mr. Holmes' bull has had rumps, but is in depth of frame, squareness of hips, and some other points, decidedly superior to Mr. Bachelder's, though he is not perhaps so well bred, nor possessed of such good hair. Mr. Bachelder was more fortunate in the cows, beating Mr. Holmes, as he did last year, with a deep and well-made cow, that is also a good milker. The second prize cow is from the late Sir Charles Knightley's herd, and though a massive cow, with well-sprung ribs and good wide back, did not show well, and looked out of health. In heifers Sir T. Beauchamp exhibited a nicely-bred Short-horn that was certainly between three and four years old, and yet showed no signs of being in calf. Such grave doubts of her fertility being entertained, the prize was awarded to Mr. Geo. Holmes' pretty red heifer, and a commendation to his Reverend brother for a larger, but more patchy two years old. In the polled classes, Mr. H. Kett Thomson had it all his own way; the cows and heifers were not worthy of much notice, but his bull is a good animal, although a wild and bad-tempered brute. Mr. Thomson also took the prize for Southdown ewes, and Sir T. Beauchamp won both the premiums for the ewes of any breed. Mr. Goddard's pen of lambs carried off the chief

honours, the other entries being so poor that the prize for Southdown lambs was withheld. The Rev. T. S. Fellowes, who lives "over the water," in the Blofeld Hundred, ran away with two prizes, with his boar and sow of the small white breed, and the only other pigs worthy of special mention were Mr. B. Gilbert's two well-fed heavy baconers, yet the other entries were useful and good.

In addition to the stock show, there was a ploughing match, at which twenty men and boys competed; a grand distribution of rewards to a host of deserving servants—farm labourers and cottagers, who were fed as well as rewarded with money prizes; and the annual dinner of the members of the Society in the evening. Nothing here calls for a lengthened report; but it may be remembered, that at the dinner last year, the chairman stated he had just planted some of Mr. Hallett's wheat, and had tried it against some of the Brooke wheat, which was commonly grown in the neighbourhood. Both wheats were dibbled, a part with one row of holes in a furrow and planted with only one grain in a hole, and another portion of the field with two rows of holes on each furrow; the result of both experiments is against the Brighton wheat—in the thinnest planted portion the deficiency of the Pedigree is only a few pecks, but in the other part of the field the Norfolk wheat grew *two coombs* (8 bushels) per acre more!

THE WORCESTER SHOW: HOW TO HAVE SOUND HORSES AND HEALTHY CATTLE.—Much has been said against, and a good deal of opposition made, to the system which has of late years prevailed, of having the horses submitted to a preliminary examination by the members of the profession. We have always advocated this procedure, and for several reasons, but chiefly because it lies at the root of the means which are employed to supply the country with sounder horses than we daily meet with. If proof were wanting that this desideratum is being gradually attained, we have it in the fact that at the Worcester meeting not more than five per cent. of the horses were found by Professor Varnell to be practically unsound; whereas, in times of yore, twenty-five to thirty per cent. were not unfrequently met with. For the present, we are content to let this fact stand as a reply to the arguments which have been brought against the system, and especially as we shall be prepared, at a more fitting time, with an equally good answer to every objection adduced by its opponents. Of the freedom from hereditary diseases of the cattle, sheep, and pigs, we have never had more satisfactory evidence at any former meeting of the society. A few years since, scrofula was making sad inroads among some of our choicest herds; but a rejection of all such animals from competition soon gave a check to its progress, by causing the owners to look carefully to the state of those they were rearing for exhibition and stock-producing purposes. In one thing alone are we prevented from speaking in laudatory terms of the meeting, viz., in the attempts which are still made by some of the exhibitors of pigs to impose upon the public, through the influence of the society, by showing animals which exceed the proper age. We fear the continuance of this evil depends upon the too lenient views which have been taken of the conduct of former offenders—the exercise, in fact, of an overbearing charity. We rejoice to see, therefore, that this matter is to come before the council, and we doubt not that, either by the expulsion of the offenders from the society, or by some other equally stringent but just measure—just, because the honest exhibitor will be rightly done by—an effectual check will be given to all such practices.—*The Veterinarian.*

THE PRESENT CONDITION OF IRELAND.

At the command of Lord Carlisle, the present lord-lieutenant, Dr. Neilson Hancock of the Irish bar has investigated the statements which have been alleged to prove a progressive decline of Irish prosperity, and to ascertain the real state of the country, and to report thereon. This task the learned gentleman has executed in an able manner, and the results are given to the public in a pamphlet, addressed to Major-General Sir T. Larcom, K.C.B., Under-Secretary to His Excellency the Lord-lieutenant. It contains a vast amount of important statistical and other documentary details, the first portion of which relates to the acknowledged decrease of the population of Ireland, which, since 1847, embracing a period of sixteen years, has been diminished to the extent of three millions, when the natural increase that ought to have taken place is added to it. Dr. Hancock shows that this decrease has arisen, to much the largest extent, from emigration to foreign parts and immigration to England of upwards of 40 per cent. in the ten years between 1851 and 1861. Previous to the former year, upwards of 300,000 persons had so immigrated in the previous decade, chiefly at the time of the famine which drove so many of the peasantry from their homes. Whether this immigration is an evil or good, will not admit of a question. Those who left Ireland to settle in England are certainly much better off; and those who remain feel the benefit of it in an increase of wages, the consequence of a decrease of hands. Thus far, therefore, the loss of population has become a gain in point of prosperity to both parties—those who have left, and those who remain.

The second portion of the report refers to the statistics exhibited in the late returns of agricultural produce, and the alleged decrease in the quantity of land under cultivation. Into this question Dr. Hancock has fully entered, by taking the number of acres under crops of all kinds, and the various descriptions, from the year 1847, when the statistics were first collected, to the present time. By these he shows that in 1847 the number of acres was 5,238,275, whilst in 1860 it was 5,970,139, being an increase of 731,864 acres. Since the latter year there has been a decrease, but the statistics show that, even with this deducted, the number of acres under crop in 1862 was 500,000 greater than in 1847, and that what actual decrease has taken place has been owing to the unfavourable seasons of 1861 and 1862. Thus, wheat culture has decreased from 743,871 acres in 1847 to 357,816 in 1862, which Dr. H. ascribes to the unfavourable character of the climate to the production of that cereal, although, in some parts, a large produce is frequently obtained. But even in those parts the climate is so damp that the wheat is usually kilndried before it can be ground or shipped. This variation, however, in one year—and it has occurred on other occasions—is no proof of declining prosperity, but rather of a change in the policy of the agriculturists, who find that grazing is better adapted to the country than the cultivation of cereals. Barley and oats have little varied of late years in the number of acres, being 2,200,870 acres in 1847, and 2,000,000 or rather less in 1862. But with this decrease in cereals there has been a correspondent increase in potatoes, although for the last three years even that has gone back in a slight degree. In the produce of potatoes, however, there was a large deficiency from 1859 to 1862.

Root crops have not much increased, although the climate is favourable to their cultivation. The produce has

certainly decreased, and so it has in England and Scotland, on account of unfavourable seasons. The cultivation of flax has not so much increased as it ought to have done, considering the adaptation of the soil and climate of Ireland, and its successful culture in the north of that country. This is the fault of the landlords; for the rural populations have neither the money nor inclination to form the necessary establishments of scutching mills, &c., which the landowners could do. There is plenty of land of thin quality, unfit for growing cereals, that would produce flax of fine quality; but all the efforts of the Government to stimulate and promote its culture are ineffectual.

The tables of live stock, on a *prima facie* view, show a considerable decline in value since 1857. In 1841 the value was estimated by the Census Commissioners at £21,000,000. In 1849 it had increased to about £25,000,000; and in 1857 it had reached the maximum of £35,368,259. In 1862 a decrease had taken place to £31,204,325. But Dr. Hancock shows that if the real value of the stock was taken, there would be an enormous increase. In explanation of this, in 1831 the price of beef in Dublin was 45s. per cwt., but in 1860 it was upwards of 60s. Now, the estimates of the Commissioners, taken in 1831, gave the average value of the live cattle at 26 10s. per head; and *this has been the standard ever since*. Whereas Dr. Hancock shows that if the *present* value were taken, the aggregate in 1859 would have amounted to about £53,000,000; which proves that the wealth of the country has largely increased, instead of decreasing.

But there is a reason for the decrease in the number of cattle the last three or four years, which Dr. Hancock has not touched upon, but which we learn from other sources. The high price of young stock as well as fat cattle, pigs, and sheep in England has induced the Irish farmers both to fatten the stock of all kinds at an early age, and also to send their lean stock to the English market in greater numbers; and this movement has been rendered more necessary by the severe losses sustained in the cereal crops, which in three years Dr. Hancock estimates at the amount of two years' rental. In these severe losses, which from 1860 to 1863 he states at upwards of £37,000,000, the Irish farmers only share the fate of those of England and Scotland. It is only last week we were told of a young Scottish farmer who lost in 1862 £1,500, and expects to lose £2,000 in the present year, and the English farmers last season lost one-third of their cereal crops without thinking of ascribing the loss to any other cause than the season, which was unfavourable. And it is to this cause *alone* that any interruption to the prosperity is to be ascribed, and the Lord Lieutenant or the general Government has no more to do with it than the man in the moon, if so much, for a great deal is usually ascribed to his influence in mundane affairs.

With regard to the labouring classes, there has been a decided improvement since 1841. The losses of the farmers, too, have had much to do with the value of labour, for it cannot be that the master should be distressed, and the labourers escape. Their poverty is aggravated by the refusal of the Irish Poor Law Commissioners to allow occasional out-door relief, and the praiseworthy reluctance of the respectable poor to enter a workhouse. In this respect the systems of England and Ireland ought to be assimilated, were it not that the poor of Ireland are so accustomed to begging under any circumstances, as that it

would be difficult to ascertain whether an applicant for out-door relief was really needy or not.

The investments in savings' banks have been greatly affected by the failures of the Clonmel and Dublin establishments; but the deposits in joint-stock banks have increased from £5,567,851 in 1840 to £16,042,140 in 1859, since which the necessities of the farmers have caused a decrease amounting to £1,636,315. The large sum, however, still in hand shows that the farmers prefer a two per cent. interest from a bank to the much larger profit that would accrue to them by laying out the same money in improvements of the land.

Notwithstanding the losses that have been sustained in

Ireland, in common with the English and Scotch farmers, the capital of the country has increased from £80,000,000 in 1841 to £120,000,000 in 1859, since which a decrease of £8,000,000 has been sustained. We may hope that the crops this year, which are abundant, will more than replace that sum. The loss in farming produce of £26,000,000 in three years is a more serious and deplorable affair, and will require more than the prosperity of one season to replace it. But even the large crops of 1863 are converted into a grievance in that country, because it has so much lowered the price that they make nothing of it. We leave them to reconcile such grumbling with the duty of gratitude to Providence for an abundant harvest.

THE MALT-TAX AT ARMS' LENGTH.

Invited to enter upon the malt-tax, the hon. and gallant member said in the seventeen years for which he had represented North Essex he had never been found deficient in voting upon the subject in support of the agricultural interest. He thought, however, the less an agricultural member, who was known to be sound, pledged himself upon the malt-tax, the better. If he were to enter upon the subject he might say something which would catch him, and for which he should be sorry. He would say, then, to his friends, "Look to my past conduct on the malt-tax, and have a lively faith in what I shall do in future." (cheers.) The above is from the report of the speech of Major Beresford, as delivered a few days since at Castle Hedingham to the members of an agricultural club, and in the honourable gentleman's capacity as one of the Members for North Essex. It would appear that in the course of a lengthy address the speaker only referred to the subject of the malt-tax when specially invited to do so, although he had touched upon a variety of other topics of more or less importance to the rural interest. He dwelt, indeed, with some force and emphasis upon the condition of the labourer, but without ever seeming to think that the improvement of the working classes would be in any way advanced by the removal of this now anomalous duty. It is not our intention here to enter upon any of the general arguments that may be offered against the continuance of the duty on malt; but surely if any one has a reason to complain it is the working man. Let us look to the relative injustice involved in the tax he pays upon a pint of beer, and that the Major does *not* pay upon a bottle of Claret, and we shall see in a moment how necessary it is that this matter should be quite as closely considered as the spread of education or the erection of better cottages—both very essential things, no doubt, but hardly more so than the question of meat and drink, so directly dependent on the malt duty. Major Beresford, however, sees nothing of the kind, but treats the point, only when pressed upon him, evidently with some testiness, and sits down rather abruptly with the vaguist of promises, but still sufficiently satisfactory to command the *cheers* of the meeting. We are sorry to say that we cannot so readily echo such a sentiment of approval as is here conveyed by the Essex agriculturists to their representative. On the contrary, we have a very decided opinion that the *more*, rather than the *less*, an agricultural member who is known to be sound pledges himself upon the malt-tax, the better—at least for his constituents. But Major Beresford is a cautious conscientious man, who if he "entered upon the subject might say something which would catch him;" when, if he really means anything in what he implies, all he could

say, no more and certainly no less, should be—that he would do everything in his power at every possible opportunity to obtain the repeal of the malt-duty. In preference to any such straightforward avowal, the honourable Member for North Essex asks his friends "to look to my past conduct on the malt-tax, and have a lively faith in what I shall do in future." They must have a lively faith indeed, if they are content with such an assurance as this! though their *cheers* would go to declare that they were. As one of the leaders of the Country Party, we would ask of the honourable and gallant gentleman what that side of the House has ever done to get off the malt-duty during the seventeen years he has sat for Essex? In or out of office, have he and his fellows, as a body, ever been really in earnest on the business? Have they not, on the contrary, shirked the subject whenever they will could—ever prepared with the cuckoo cry that "the present was not quite the time for any movement"—and so forth? Three or four Conservatives have recently gone honestly up to the collar; but for session after session poor Mr. Ball raised his voice against the monstrous inconsistency of such an impost being any longer levied, with scarcely a cheer to encourage him from his own side, and a peculiar smile running round the House, too significant of the Quixotic battle he was supposed to be fighting. If we are to look to what Major Beresford and his colleagues have done towards repealing the malt-tax during the last seventeen years, and gather from any such experience a lively faith for the future—if the farmers are ready to take such assurances with *cheers*, we tell them candidly that the agitation for repeal had better be dropped, for it can end in little but loss of time and money. Their friends in Parliament have not merely done nothing, but far worse than nothing. They have continued to lead the sufferers on with the vaguist hopes and promises, and, like Major Beresford at Castle Hedingham, have carefully abstained from referring to the matter, save when it has been absolutely forced upon them. And then—"the less they pledged themselves the better!" Let us talk of a bountiful harvest, or the war in America, or labourer's cottages, or anything you please, gentlemen, but the malt-tax—surely that is not a matter of much importance to any of us.

But we have said there are a few members of Major Beresford's party who are anything but inclined to put off the battle, but give the farmers encouragement rather to fight it out at once. Here, for instance, is something of what Mr. Bentinck said in Norfolk:—"Let me ask any gentleman here present, does he suppose that there is any other great industry extant, with the exception of what is commonly called the agricultural interest, but which I think ought to

be more fitly described as the interest of the rural districts of the country, because that more fairly describes its comprehensive character—is there any other interest in this country to be found, who would submit for one hour, or for one minute, to the intolerable injustice which I have just brought before you? Apply it for one moment to any one of the great interests of this country, which, in point of numbers, in point of wealth, and in point of extent, are as nothing as compared with the great rural interests of the country, and what would they soon do and say? Would they submit to it for a second? Not they. They would do this—they would do what the rural districts of this country have never done—they would band themselves together to a man, and they would say, 'We will not submit to this gross and this glaring injustice. We will never rest till that injustice is remedied. We will make an appeal to the parliament of the country. Until that injustice is remedied, our voice shall not cease to be heard.' But is that the case with ourselves? We grumble amongst ourselves. We say that we are over-taxed; and it is quite true that we are over-taxed; and if we go on much longer as we are now, we shall be still more over-taxed, because every year adds something more to the burdens which are imposed upon the rural districts of England. But whom have we to blame? Why, I at once say we have ourselves, and ourselves only, to blame. It is quite true (I don't want to go into political questions) that, by various combinations and arrangements which have occurred during the last few years, there is no doubt of the fact that the rural districts of this country are inadequately represented in Parliament—that is to say, that they have not, in proportion to their numbers and to their property, within a very large number, the amount of representation to which they are entitled." This is plain, straightforward, and all after our own hearts. Then, again, at Royston, the Honourable Eliot Yorke, a worthy succe-

ssor to Mr. Ball, goes equally to the point:—"When Mr. O'Connell urged particular advantage for Ireland, he used the words, 'Agitate, agitate, agitate!' When Sir Robert Peel—that Gamaliel under whom we first enacted the rudiments of protective laws, and their beneficial influence on agriculture—was desirous of increasing his Parliamentary support in the House of Commons for their maintenance, he said, 'Register, register, register!' Significant words. Let us apply them to this subject. I say, unite, then. 'Agitate, agitate, agitate! Register, register, register!' Such high authorities as I have cited, when influenced to gain and maintain any given useful object, justify you in adopting a similar course, when the object is hurtful in practice and unjust in principle, to defeat and avoid it. What is denied to justice, seek by importunity. Agitate the question: register those who are favourable to its repeal; and, as all great questions have been carried by such means, use them now. As the hop duty and paper duty fell before continued sap and assault, so use the means in your hand that this duty, on the score of its gross injustice, no longer encumber the progress of your agricultural prosperity. The question has its difficulties. I know them all; but its injustice is its best solution of them; for when did an injustice, acted on by popular will, long prevail against its concentrated action?" Compare such manly addresses and out-spoken advice as this, to register every one favourable to the object, with the careful fencing of Major Beresford not to commit himself—or to say anything which might catch him—but have a lively faith and so forth. Unfortunately, however, the majority of the county members, so far as we have tested them, act precisely over the matter as does Major Beresford; the minority like Mr. Eliot Yorke, Mr. Bentinck, Major Bartelot, and a few more. As Mr. Bentinck himself put it, "there is no doubt but that the rural districts are inadequately represented."

GIVING HORSES SULPHURIC ACID (OIL OF VITRIOL).

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—“A Reader of many Years” made an inquiry, through the medium of your columns, October 12th, 1863, what the effects of giving horses a few drops of the above in a pint of water would be? stating he had found a bottle containing oil of vitriol, labelled “poison,” in the possession of his carter; and in fact, he (master) had given one or two doses to his own horse.

From this we may infer that master and man possessed equal information on the properties of this “mysterious” compound of sulphur and oxygen *plus* water and impurities, till the issue of your last week's publication, where your correspondent “B. F. E.” informs him that he should think the result would be the discharge of the carter; and another, “A Heavy Sufferer,” says, “The result will be, certain death of the animal within two years, and the *post mortem* will exhibit the internals perfectly rotten;” and advises him to discharge the carter without a moment's notice. On what grounds? we may ask; because he was as knowing as his master, and evidently takes as much interest in his animals as if they were his own, and like many other foolish carters, who spend their scanty wages, to the risk of losing their places, on what they consider for the benefit of these animals placed under their care.

Now, sir, I am not an advocate for men to be continually physicking horses, giving them drugs the properties of which they know little about, and putting them into the stomachs of animals of which they know less; and I am perfectly aware that serious mistakes are continually being made, and heavy losses sustained by the owner, by ignorant men persisting in meddling with drugs, and giving them to their animals to stimulate their appetites, or to excite some excretory

organ. Still, I cannot agree with your correspondent's harsh and unreasoning judgment of discharging an interested man in his master's property without a moment's notice, and neither of them proving the poor fellow had done anything wrong. I can see nothing very censurable in the act of a man giving a few drops of acid in a bucketful of water to a horse, with the exception it is taking an unauthorised liberty. He might have imagined calculus concretions existed in the stomach or urinary organs of his animals, from consuming a large quantity of bran or other phosphatic feed, and resorted to the acid with the belief that it would attack the lime-balls and dissolve them; or he might have tested the excretions, and found them to be alkaline, and to counteract this tendency he had given a little acid—just what many scientific men are doing every day. For my own part, I should not be afraid to take a draught of the water so acidulated as that given to the horses, and as often as the carter deemed it necessary to give it them, provided the water was naturally clean; and be quite comfortable about the rotten condition of my internals at the time a *post mortem* examination was made; and in this state they undoubtedly would be, if left a few hours after death, or in less time, if I had expired under the pains of inflammation of the same. I opened a valuable horse not many weeks since, which had died from *enteritis*, within seven hours after death; and at intervals, where intussusception and strangulation of the intestines had taken place, more particularly the latter, gangrene, or mortification—in other words, rotteness—was manifested, by the coarseness the muscular structure of the intestines was disintegrated, &c.; yet no sulphuric acid had been given in this case.

The small quantity of sulphuric acid mentioned by your

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correspondent, in so much water (bucketfull), could scarcely have made it appreciable to the taste, as we are not supposed to think the water was distilled, without which we may infer it contained a certain quantity of bicarbonate of lime held in solution; and at the moment the oil of vitriol was added, and with the strong affinity of the latter for lime, a new and harmless compound was formed—namely, sulphate of lime—and the carbonic acid liberated; or supposing the water contained little iron, the result would be little sulphate of this metal—a mild tonic in such small quantities, which, when in contact with the organic matter contained in the viscera, suffers deoxidation, resulting in the formation of sulphuretted or sulphide of iron, a black compound; and no doubt this is what "A Heavy Sufferer" has seen on opening an animal, and from the appearance of which he concluded it was a rotten condition of the internals.

Masters should not be so hard with their men, and never discharge a valuable servant without good grounds for complaint; and where horses are considered a portion of the paying stock of the farm, such a man is indispensable to have the care of them. How can we, as masters, expect to have the interest of those under us, if we treat them with such hasty and unreasonable conclusions? To have a man's labour and time, without his interest, is losing fifty per cent. of his value. If "A Reader of many Years" have any antipathy to his horses being drugged (which his carter deems necessary at this time of year and at spring), and knowing the value of a good servant, he should humour him a little, and caution him against giving his horses drugs whose properties he can know but little of, and doctor his horses himself, if it is only with bread boluses covered with flour. On the same principle, doctors cover bread-pills with gold-leaf for young ladies (who fancy themselves ill), when they don't wish their pretty little mouths to be put out of sorts by the unpalatable drugs employed in making them; or, still more simple, by wrapping up little flour in the form of medicinal powders, and strewn over the chaff once or twice during the autumn months, which will have a wonderful effect on the improvement of the condition of the animals in the eyes of the carter, and I should not be surprised if shortly after the administration of those "magical" compounds he does not inform his master that "Them powders has done the horses a world o' good." Same as an old farmer declared to me, when enlarging on the virtues of oil-cake, that he could

"actilly see the flesh rising on the ribs of his cattle whilst eating it!" This shows what a wonderful power the imagination has over the senses.

But to return to our subject of physicking horses, which is sure to be done in some way or other, if you have a good carter who takes a pride in his team, with the belief the horses require a "cleaning" out on coming in from grass; and such a man, if managed rightly, is of great service to the farmer, who never need trouble his head about the safety of his horses when on the road or other places from under his superintendence: all he has to do is to see the carter does a fair day's work with them. The principal object the carter has, in doctoring his horses, is with the view of seeing them obey the calls of nature without any apparent difficulty, and to see the urine voided without any muddy deposit—a sight which very much harasses the sanguine carter, and consequently he often resorts to very powerful drugs, which excite the kidneys and urinary organs, greatly to the manifest injury of the animals so maltreated. This difficulty the farmer can easily overcome by a milder kind of treatment, viz., a little nitrate of potash—from a dram to half-an-ounce thrown into the animal's drink-water two or three times during the autumn and spring months, which is a cooling as well as a mild diuretic agent. A lump of rock-salt should be placed within reach of the animals, that they may lick it when they please, which will be found to increase their appetite and powers of digestion, thus enabling them to assimilate a larger proportion of the food they consume, and their powers of endurance will be increased in like ratio; and when the carter finds his master taking interest in the respectable as well as paying condition of his team, he (carter) will no longer resort to drugs, of the nature of which he knows but little, or to medicinal herbs, the offensive nature of which the instinct of the animals would teach them to refuse, were it not hidden by being mixed with a tempting feed of chaff, corn, &c., and, from the little power he has of ascertaining the quantity of the exciting agent he employs, far more likely to do more serious injury to the animals than by obtaining a drug from the chemist carefully labelled "Poison," the very idea of which would tend to make him more scrupulous in administering the agent.

W. H. H.,

Member of the Royal College of Agriculture.

Gloucestershire, Oct. 21st, 1863.

THE BATTLE OF THE REAPERS.

We have observed, for some time past, an interesting discussion between the editor of the *North British Agriculturist*, on behalf of Mr. Bell versus Mr. C. H. McCormick, of America, the inventor of the reaping machine which created such a sensation when it appeared in our first Great National Exhibition in Hyde Park, in 1851.

The correspondence originated about the award of the gold medal to Mr. McCormick by the implement jury at the late Hamburg International Exhibition, which was inserted in the *Mark Lane Express* of August 3rd. It had been reported to the editor of the *North British Agriculturist*, by some person, that the award of the gold medal was merely an honorary thing, having no connection with the trial of the merits of the reaping machines; but a letter from the American juror, published in the course of the correspondence, seems to confirm the fact, not only that the award was made as given in the *Mark Lane Express*, "for the practical introduction and improvement (or perfecting) of the reaping machine," but that it "means exactly what it says."

In the course of the correspondence, the question arose as to the "invention of the reaping machine;" and, while the editor of the *North British Agriculturist* shows much zeal for his countryman's (Mr. Bell's) machine, we must say that we think that the facts and arguments of Mr. McCormick are presented with a clearness and force which seem unanswerable in establishing—that he was the first to invent the leading features of the successful reaping machine of the present day; that he continued regularly the

improvement and prosecution of the same to the perfection of the machine; and that this—in the slightly-varied language of the different scientific juries of the various great national Exhibitions of the world—constitutes the invention of the reaping machine. In fact, before the Great National Exhibition of 1851, if reaping machines were invented, they were unknown to the English farmers.

We extract some paragraphs from Mr. McCormick's letter, which appeared in the *North British Agriculturist*, of Oct. 15, which seems to have closed the discussion, and appears to us to settle the question:—

"What, then, are these original features of the successful reaping machine of the present time? They are—first, the application of the draught forward and at one side of the machine, called the *side-draught* machine, which was successfully done in my first machine of 1831, as shown in my patent; the application of the power at the rear, as referred to by the New York Remonstrants, only having been experimented with in a machine constructed immediately preceding my application for the patent, but which was not continued afterwards. The *side-draught* had first been used with a single horse in shafts, when it was thought a wider machine might be propelled to advantage from the rear: hence the experiment.

"Second, the *cutting apparatus*, with a serrated reciprocating blade operating in fingers or supports to the cutting over the edge of the sickle. This was also done by me successfully in 1831, with the single bearing or support on one side of the sickle, and with the double bearing (on

both sides) in 1882, as proved by the testimony taken in the case, when this machine cut 50 acres of grain.

"Third, the fixed platform of boards for receiving and retaining the corn as sent and deposited thereon by the gathering reel, until collected in a sufficient quantity or size for a sheaf.

"Fourth, discharging it from the platform on to the ground in sheaves at the side of the machine, out of the track of the horses in their next passage round.

"Fifth, a divider for separating, in connection with the reel, the corn to be cut from that to be left standing—a further improvement upon which, with other improvements in detail, having become the subject of a patent in 1845; while the arrangement of a suitable seat on the machine so as to enable the attendant the more easily and completely to deliver the corn from it, was also the subject of a third patent in 1847.

"And now, while in law he who fails to reach the point of practical and valuable success does nothing, and he who con-

tinuously and vigorously prosecutes his invention and improvements to that point is allowed to prove back to his first experiments—with these foundation principles claimed in my machine, how does Mr. Bell stand on the Editor's idea of 'the great similarity of the general principles adopted in reaping machines?' Propelling them from the rear was the method adopted in nearly all the experiments made from the time of the Gauls to the time of Bell's connection with the reaping machine. The Editor has shown that Salmon's machine cut by shears (in 1807); and Smith's laid the corn in swathe in 1811—which was also done by my father's machine in 1816—while I must again be permitted to repeat that Bell's machine while lost to the public at least in 1851, never would have been practically and commercially valuable with his cutting shears, and his gathering reel of 'two and a-half feet in diameter,' instead of six to eight feet, as subsequently used in its connection with my cutting apparatus."

CALENDAR OF AGRICULTURE.

Finish the sowing of wheat, if any remains undone from last month. Take up Swedish turnips, store the roots at the homestead, and give the tops and small bulbs to sheep in the fields, and to young cattle in the yards.

Flood watered meadows. Clean out, and put into proper order for use, the main channels, conveying gutters, and the sluices of floodgates.

Begin to cut underwoods; plant forest trees; open-drain plantations; repair old fences, and make new ones; cut open ditches, and repair roads.

Thrash regularly twice in a week, in order to supply the animals with food and the yards with litter. Cut chaff of hay and straw for the horses, the fattening bullocks that are tied up, and for being steamed for the milch cows. Apply all litters over the yards thinly and evenly, and spread over the surface all matters of different qualities, for the purpose of being mixed.

Give to the cattle in the yards, by break of day, an ample supply of turnips, rooted and topped for the fattening animals, and with the tops attached to the other cattle. Wooden cribs with latticed bottoms are the best in purpose of use, as the filth and rain-water escape freely downwards. The turnips should be wholly consumed before night,

to prevent accidents from choking happening unseen. Give to milch cows cabbages and beet-root, and one meal daily of steamed food.

Continue the feeding of sheep, as directed last month. The animals may be folded over nights on the bare ground, in mild climates; but more generally they must be allowed to run back for shelter.

Feed pigs, as directed last month, with very ample littering to keep the animals dry, and to make manure, of which swine are the best of all manufacturers. Feed poultry with light grains, and with steamed potatoes and meals mixed, and given in troughs placed in a shelter-shed in the poultry-yard.

Attend to the feeding of young horses in the farm-yard. Provide a regular supply of fresh-water in a trough, and a convenient dry shelter-shed; give hay and straw-chaffs, bran and oats, with a feed daily of raw or steamed roots. The first winter is the chief agent in forming good animals of any kind.

Begin to plough stubbles for next year's fallowing, and prepare by working the lands for next year's green crops, so long as the weather will permit.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Protect the artichoke plants by mulch or masses of leaves, after removing all the old stalks and decayed foliage. Dig roots for temporary supply of the so-called Jerusalem artichoke. Store all the potatoes, carefully observing the condition as to soundness or decay. Keep the store very dry.

Broccoli and cauliflower in the open ground should be laid down, and be guarded with a covering of dry earth laid close over the stems.

Dig and store carrots, also beet-root and some parsnips.

Finish earthing celery; if frost threatens, cover the ridges and tops with dry haulm.

Tie-up some plants of endive, and remove others to dry frames for bleaching.

Give air to lettuces in frames, and also to radish and salads.

FRUIT DEPARTMENT.

Pruning of fruit trees and bushes is best done in February; but at this time the spur-pruning of apple and pear trees may be done in mild weather.

Raspberries may be tied by fillis-cord neatly to stakes, six rods to each, stopping at an angle to-

wards the north, or to a neat open trellis. A full exposure to the sun by the last mode is very favourable to next year's growth: plants are too much crowded by the upright tying to stakes.

FLOWER GARDEN.

Plant tulips, hyacinths, jonquils, and all bulbous roots, in rich sandy beds; open the holes neatly, insert the bulbs one or two inches deep, and cover

the roots all round with a fine earth. Move herbaceous plants, roughly fork the surface of beds, and scatter decayed leaf-mould and old dung of cattle over the surface. Observe order and neatness everywhere.

Semi-hardy plants, in pits or frames, must be kept dry and aired occasionally. Dry sawpit dust plunged about guards the mould very effectually.

THE METEOROLOGY OF OCTOBER.

Variable weather characterized the latter days of September, and also those at the commencement of October. The barometer increased during the first part of this period to 29.90 inches by the 29th of September, and then decreased to 29.09 inches by the 1st of October. The mean daily temperature values from the 27th of Sept. to the 2nd Oct. were below their average values to the mean amount of $2\frac{1}{2}^{\circ}$, and the several amounts of deficiency were as follow: 3° on the 27th, 5° on the 28th, $4\frac{1}{2}^{\circ}$ on the 29th, $3\frac{1}{2}^{\circ}$ on the 30th September, and less amounts on October 1st and 2nd. The 27th and 29th of September were fine dry days, and their respective degrees of humidity were 78 and 72; whilst on the 28th of September and October 1st and 2nd rain fell to the collective amount of three-quarters of an inch. On the 3rd and 4th days of October the mean temperature values were in excess of the averages for those days by the amounts of four and five degrees; whilst the two following days, namely the 5th and 6th, were extremely cold, and their mean temperatures were in defect to the large amounts of $3\frac{1}{2}^{\circ}$ and $7\frac{1}{2}^{\circ}$. The mean temperature of the 6th day, namely 44.8° , was less than that of the 4th by as great an amount as 13° !

On the morning of the 6th, about 3 h. 23 m., a slight but distinct shock of earthquake was felt generally throughout the country. In this neighbourhood it was only just perceptible, and its chief violence seems to have been experienced in the midland and south-western counties. This phenomenon, from its extreme rarity, has already been so well and so fully placed before the public that it is perfectly unnecessary further to enlarge upon it, as the leading facts are doubtless well known to all of our readers.

From the 7th day a warm damp period ensued, which continued for sixteen days, or till the 22nd. During this period the average daily excess of temperature amounted to $4\frac{1}{2}^{\circ}$; and individual values deserving notice are $8\frac{1}{2}^{\circ}$ on the 19th, about $6\frac{1}{2}^{\circ}$ on the 8th, 10th, 21st, and 22nd, nearly 6° on the 14th and 20th, whilst on the remaining days of this period the amounts of excess generally varied between 2° and 5° . The last five days of this period were the most remarkable in this respect, their average daily excess amounting to nearly $6\frac{1}{2}^{\circ}$.

Between the 7th and 17th rain fell on 9 days, generally in small amounts, the total for that period amounting to 0.69 inch. Yet, with the exception of the 15th, on which day the air was absolutely saturated with moisture, and the 7th, on which it was nearly saturated, the atmosphere was not in so damp a state during the eleven days comprised

between the 7th and 17th days as it was during the five following days, from the 18th to the 22nd, during which little or no rain fell. This was owing to the calmer state of the air during the latter period, whilst its greater warmth (which has been already noticed) produced fogs and a large amount of watery vapour generally than had before prevailed through any lengthened period in the whole month.

From the 23rd to the close of our period a very cold, damp period prevailed, unaccompanied, however, by rain in even the smallest quantities. The 25th day, however, does not altogether partake of this classification, differing in many respects from the other days of this period. Its mean temperature was only 2° below its average value, and the day was fine throughout, with but few clouds present, whilst its mean degree of humidity amounted only to 78. To the other days of this period different and distinctive peculiarities belong, of which may be named the great prevalence of fog, which, in conjunction with the low temperature rendered these days of a very uncomfortable character. On the morning of the 24th, 26th, and 27th, the thermometer fell below 35° , and the mean temperature values for those days were lower than the average values by about 4° .

By examination of the tables of results we find that the highest barometer reading occurred on the 23rd of October, and was 30.13 in.; the lowest was 29.09 in. on the 1st, giving a range for the month of rather more than an inch. The highest temperature in the shade was 66.5° on the 4th of October, and the lowest 34.0° on the 24th, making a range of 32.5° . The highest reading in the rays of the sun was 95.8° on the 27th September; the lowest on the grass was 23.0° on the 26th of October. The dampest day in the month was the 15th, on which day the atmosphere was entirely saturated with moisture. The driest day was the 29th of September. The total amount of rain collected between the 27th of September and the 27th of October was 1.45 inch, an amount rather more than an inch below the monthly average.

The number of days on which a measurable quantity of rain fell amounted to fifteen, which somewhat exceeds the average number.

That the past month has been a remarkable one cannot be denied, for the mere fact in the occurrence of an earthquake shock within it would suffice to stamp it as such. But independently of this, the extraordinary variability in temperature during the month, and its generally damp condition, yet almost entire freedom from rain of any heaviness, still further tend to stamp this month noteworthy characteristics.

METEOROLOGICAL ELEMENTS FOR THE NEIGHBOURHOOD OF LONDON;

FROM SEPTEMBER 27TH, TO OCTOBER 27TH, 1868.

Month and Day.	Temperature of the Air in Shade.			Highest Reading of a Thermometer in the full Ray of the Sun.	Temperature of Vegetation.*	Degree of Humidity. (Saturation=100).	Amount of Cloud, 0 to 10.	Amount of Rain. Inches.	General Direction of the Wind.	Weather Remarks.
	Highest.	Lowest.	Mean.							
1863.	°	°	°	°	°					
Sep. 27	58.0	37.5	51.6	95.8	27.8	78	8.0	0.00	s.w.	Generally cloudy
28	57.8	43.0	49.2	88.0	37.6	84	6.0	0.21	s.w., w.	Rain; overcast; clear
29	60.8	39.2	49.5	91.5	27.7	72	2.5	0.00	s.w.	Fine; few clouds
30	63.2	35.0	50.5	95.5	28.6	88	9.0	0.00	s., s.e.	Generally cloudy
Oct. 1	62.0	50.1	53.8	88.2	44.4	90	4.8	0.52	s., s.w.	Heavy rain; cloudy; clear
2	56.4	48.0	52.4	66.4	39.7	83	10.0	0.02	w.n.w.	Overcast; slight rain.
3	61.0	52.5	57.1	66.4	46.0	96	10.0	0.04	s.w.	Overcast; little rain
4	66.5	53.0	58.0	82.6	52.7	83	9.0	0.00	s.w., w.	Generally cloudy
5	57.8	41.6	49.4	75.0	32.7	90	9.3	0.04	s.w., s.	Partially clear; slight rain
6	52.3	37.5	44.8	73.8	37.5	83	3.5	0.00	w., s.e.	Slight shock of earthquake
7	60.5	47.0	53.8	83.6	32.3	97	9.0	0.15	s.e., e.	Cloudy; rain; lightning
8	64.4	54.8	68.9	84.7	50.8	88	8.0	0.06	e.	Cloudy; thunder; rain
9	59.0	46.9	50.8	85.4	44.1	89	5.5	0.06	s.e.	Cloudy; rain and lightning
10	62.5	54.0	57.8	82.7	42.5	76	9.0	0.13	s.e.	Rain early; then cloudy
11	61.1	51.0	54.7	90.7	47.1	78	6.7	0.02	s.e., s.w.	Slight rain early; cloudy
12	62.0	48.3	54.3	91.7	42.2	77	6.8	0.00	s.e.	Variable
13	57.0	48.8	52.8	72.0	44.5	87	5.3	0.08	s.s.e.	Partially cloudy; rain
14	63.7	49.9	55.9	93.4	41.8	80	3.0	0.00	s.e., s.w.	Few clouds; fine
15	58.8	49.3	52.8	64.0	40.1	100	8.3	0.12	s.e., s.w.	Generally cloudy; rain
16	61.2	48.0	52.9	94.0	39.1	82	5.8	0.05	s.w.	Rain early; partially cloudy
17	62.0	46.9	53.4	87.8	39.2	81	4.3	0.02	s.w.	Cloudy; night clear; rain
18	61.4	45.3	54.0	91.0	38.0	84	10.0	0.00	s., s.w.	Generally overcast
19	61.6	54.8	57.5	70.0	48.0	88	10.0	0.00	s.w.	Overcast
20	59.7	52.1	55.0	67.0	50.5	92	10.0	0.00	s.w., s.e.	Morn. overcast; then gloomy
21	62.4	50.0	55.4	88.0	48.9	91	8.8	0.03	e., s.e.	Generally cloudy; slight rain
22	63.5	48.9	54.9	85.0	48.1	88	9.0	0.00	s.w., w.	Cloudy generally; little rain
23	55.0	41.1	46.9	71.7	36.2	86	3.0	0.00	n.	Partially cloudy; hazy
24	52.8	34.0	43.7	57.3	33.5	96	10.0	0.00	CALM.	Foggy morn.; overcast day
25	54.4	39.4	45.5	84.0	28.6	78	1.0	0.00	s.e., e.	Fine, with a few slight clds.
26	55.5	34.8	43.6	84.0	23.0	98	5.0	0.00	N.E.	Morn. foggy; cldy.; overcast
27	51.1	34.7	43.6	58.0	31.8	96	10.0	0.00	CALM.	Overcast; fog very prevalent

* The "temperature of vegetation" is that obtained from a self-registering thermometer placed on the grass at night. It is therefore a minimum reading for the previous twenty-four hours.

TABLE SHOWING THE PRINCIPAL FLUCTUATIONS IN THE ATMOSPHERIC WAVE, FROM SEPTEMBER 27TH TO OCTOBER 27TH, 1868.

1868.		Reading of Barometer.*		1868.		Reading of Barometer.*	
Month, Day, and Hour.		Highest.	Lowest.	Month, Day, and Hour.		Highest.	Lowest.
		Inches.	Inches.			Inches.	Inches.
Sept. 28, 9 a.m. ..			29.57	Oct. 17, 9 p.m. ..		29.95	
" 29, 9 a.m. ..	29.90			" 18, 7 p.m. ..			29.89
Oct. 1, 3 p.m. ..			29.09	" 21, 9 a.m. ..		30.03.	
" 5, 9 a.m. ..	29.88			" 22, 3 p.m. ..			29.96
" 9, 9 p.m. ..			29.38	" 23, 9 p.m. ..		30.13	
" 10, noon ..	29.55			" 25, 1 p.m. ..			29.85
" 13, noon ..			29.16	" 26, 9 a.m. ..		29.90	
" 14, 9 p.m. ..	29.58			" 27, 9 p.m. ..			29.69
" 15, 3 p.m. ..			29.40				

still falling.

* All the readings are reduced to the constant temperature of 32 degs.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
OCTOBER.

The weather of the past month, though somewhat humid, has, on the whole, been favourable for out-door farm labours. Ploughing and sowing have therefore progressed steadily, and a portion of the heavy wheats has been sown under favourable auspices. Those which have made their appearance above ground are looking remarkably healthy. Rather large quantities of new wheat have been thrashed out in most of our leading counties, and the result of thrashing has fully justified our anticipations in reference to the yield. In some districts the produce is enormous, and in scarcely any instance is there any deficiency in it. We have, therefore, grown about the most abundant crop on record, as to quantity; whilst, as to general quality, it has seldom been equalled. This great abundance, even in the absence of overwhelming importations from abroad, has had a depressing influence upon the demand for all kinds; but it has not led to any further serious decline in the quotations. The abundance of the crop of barley has produced much heaviness in the inquiry for that article, and a slight downward movement in prices. For the most part our markets have been heavily supplied with both English and foreign qualities, the former in remarkably fine condition. All other kinds of produce, but especially oats and beans, have sold slowly on easier terms. Large supplies of flour have changed hands, at about stationary prices.

The advices from nearly all parts of the Continent are to the effect that the grain crops generally are giving a very large return, but that the demand for produce on English account has continued unusually inactive, notwithstanding the low prices at which wheat, barley, and other articles have been offered. In America the export inquiry for wheat, flour, and maize has continued somewhat restricted, owing to the inactive state of the markets in the United Kingdom. From the 1st September to the 5th October, the exports of flour from New York comprised 154,319 barrels, of wheat 1,693,105, and of maize 239,459 bushels. Compared with the corresponding period in 1862, these returns show a slight increase in flour, but a considerable falling off in wheat and Indian Corn. It follows, therefore, that the supplies of food now on passage to this country are only moderate for the time of year. From the circumstance that gold in the States is now selling at a premium equal to 52 per cent., that the stocks of bullion in the various banks is about £2,000,000 less than last year, and that the demand for British manufactured goods is increasing, we must anticipate increased imports of breadstuffs from the States. Produce will, no doubt, be forwarded in lieu of gold to meet commercial balances.

The potato crop is proving very large, and of extremely fine quality. In nearly all quarters it is wholly free from disease, whilst our markets have been heavily supplied with most kinds. Prices have ranged from 50s. to 100s. per ton. On the Continent the growth is very extensive; nevertheless, we do not anticipate any large arrivals from that quarter, as the prices here are likely to rule too low for the shippers.

The quantity of hops produced this season has been nearly an average. The whole of the growth has been secured in, for the most part, fair condition, and a good business has been transacted in it at from 100s. to 160s. per cwt. The imports from abroad have continued good, and large supplies may be expected in December from New York. Both on the continent and in America the crop is fully equal to last season.

The cotton market having been very excited, and a further advance of from 2d. to 2½d. per lb. having taken place in the value of raw cotton, there has been an improved demand for nearly all kinds of wool, especially for English, and prices have had an upward tendency. The next public sales of colonial wool will be commenced on the 5th November, and about 60,000 bales will be brought forward. Nearly 20,000 bales

East India and other low wools have been disposed of at Liverpool. The competition was moderately brisk, and the quotations advanced 0½d. to 1d. per lb.

The demand for both hay and straw has fallen off, although the supplies on offer have not been to any extensive, and prices have given way. Meadow hay has realised £3 to £1 5s.; clover, £4 to £5 12s.; and straw, £1 6s. to £1 14s. per load.

Most of our Scotch letters state that the corn trade, generally, has been in a very inactive state, and that lower prices have been submitted to by the growers. A few patches of wheat, barley, and oats are still out in the most northern counties; but, on the whole, the harvest has been secured in fair condition. No serious cases of disease are reported amongst the potatoes, and extensive shipments will be made to the south during the next three or four months.

In Ireland, wheat has ruled in favour of buyers, and nearly all other kinds of produce have sold on easier terms. Dealers have shown no disposition to get into stock. The exports of produce to England have been on a very moderate scale.

The turnip crop is likely to turn out well as to quality; but we apprehend that the weight per acre will not be equal to last season. Linseed and rapeseed are, therefore, likely to rule steady in price during the winter months, more especially as the imports of linseed and rapeseed are not likely to increase.

REVIEW OF THE CATTLE TRADE DURING THE
PAST MONTH.

Notwithstanding that most of the leading markets have been somewhat heavily supplied with beasts, a large business has been transacted in most breeds. Scots, Herefords, short-horns, &c., have changed hands steadily at full quotations; but the value of most other kinds of stock has had a drooping tendency. For the most part, the beasts have appeared in but middling condition. Only moderate numbers of sheep have been brought forward; but their general weight and condition have been extremely good. Generally speaking, the mutton trade has ruled firm, and the currencies have been on the advance, the best Downes having realised fully 5s. 6d. per 8lbs. The Dutch sheep have sold readily, and some of them have produced 56s. each. We have observed a great improvement in them during the month. Considerable inactivity has prevailed in the veal trade, and prices have consequently ruled very low. Pigs have moved off heavily on easier terms, although the numbers brought forward have been only moderate.

Food has continued abundant in most parts of the country; but it is pretty generally understood that the stocks of hay for winter use will not exceed the wants of graziers and others. Fortunately, however, they are in very fine condition.

A few cases of foot-rot have made their appearance in the West of England; but, with this exception, the sheep have done remarkably well.

In Scotland, and most parts of England, the numbers of stock now in course of fattening are fully equal to most former periods. Our impression is, however, that prices will continue to rule high for a considerable period. In Holland, stock, especially beasts, is abundant; nevertheless, the quotations demanded are above those ruling in 1862. The imports into London have been as under:—

					HEAD.
Beasts	..	..	..	..	11,560
Sheep	..	..	..	..	37,521
Lambs	..	..	..	..	2,399
Calves	..	..	..	..	1,129
Pigs	..	..	..	..	2,965
Total	..	..	..	..	56,574

COMPARISON OF IMPORTS.

Oct.	Beasts.	Sheep.	Calves.	Pigs.
1882	7,908	28,109	1,327	1,600
1881	5,577	42,538	1,307	5,315
1880	6,750	24,980	1,662	2,074
1859	6,026	24,323	784	878
1858	4,600	24,145	1,581	553
1857	5,819	24,102	1,998	1,333
1856	8,871	10,602	1,280	895
1855	8,136	21,187	1,358	1,501
1854	6,894	16,323	1,009	1,063

The total supplies of stock exhibited in the Great Metropolitan Cattle Market have been :—

	HEAD.
Beasts	30,512
Cows	535
Sheep	110,900
Calves	2,029
Pigs	3,439

COMPARATIVE SUPPLIES.

	Oct., 1862.	Oct., 1861.	Oct., 1860.
Beasts	28,972	28,220	26,240
Cows	526	539	525
Sheep	118,780	121,390	128,250
Calves	1,855	1,626	2,289
Pigs	3,286	3,650	2,620

The district arrivals of beasts thus compare with last year :

	Oct., 1862.	Oct., 1863.
From Lincolnshire, Leicestershire, and Northamptonshire	13,800	11,660
Other parts of England....	3,000	3,650
Scotland.....	18	28
Ireland	3,400	2,780

Beef has sold at from 3s. 4d. to 5s., mutton 3s. 6d. to 5s. 6d., veal 3s. 4d. to 4s. 8d., and pork 3s. 4d. to 4s. 6d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	Oct., 1859.	Oct., 1860.
	s. d. s. d.	s. d. s. d.
Beef.....from	2 10 to 4 10.....	2 6 to 4 8
Mutton	3 0 to 5 4.....	3 0 to 5 4
Veal	3 8 to 5 8.....	3 8 to 4 10
Pork	3 4 to 4 8.....	4 0 to 5 4
	Oct., 1861.	Oct., 1862.
	s. d. s. d.	s. d. s. d.
Beef.....from	2 10 to 5 10.....	3 0 to 4 8
Mutton	3 0 to 5 8.....	3 6 to 5 8
Veal	3 6 to 5 0.....	3 10 to 5 4
Pork	4 0 to 5 2.....	4 0 to 5 0

Rough fat has been selling at 2s. 3d. and 2s. 3d. per 8lbs., with a full average quantity on offer. In October, 1862, the price was 2s. 5d., in 1861 2s. 10d., and in 1860 3s. 2d. per 8lbs.

Newgate and Lendenhall markets have been seasonably well supplied with each kind of meat, in which a steady business has been passing. Beef has sold at from 2s. 8d. to 4s. 2d., mutton 3s. to 4s. 6d., veal 3s. 6d. to 4s. 4d., and pork 3s. 4d. to 4s. 4d. per 8lbs. by the carcase.

SOUTH HERTFORDSHIRE.

We must confess that an agricultural report at this time of the year is written with difficulty. We traverse our fields mechanically, though there is little in them to interest us; still less is there to form a subject interesting to the world at large. But, in duty bound, we must give the result of our observations. Young seeds and clover are faulty and thin, and our first step is to provide a substitute in the spring for the missing crops of seeds. We therefore sow extra fields of rye and tares, which promise to be forward, and are a full plant. Our clover leys were broken up a little later than usual, owing to the drought, but the weather has since been favourable. Wheat has gone in extremely well, and comes up quickly. Great progress has been made in wheat-sowing, and a better season for it cannot be. Wursel is being generally taken up. This crop is below an average, and in many places it is

very light. Swedes, also, are much lighter than usual, and if we have a severe winter there must be a run on artificial food, as there are no white turnips, and hay is far from abundant. Swedes have been much injured by grubs, and the quality is indifferent. Potatoes turned out well, and are a lower price than we recollect them for years past. There are complaints that potatoes do not keep so well as usual in the pit. Good rounds can be bought for 1s. 6d. to 1s. 9d. per bushel, and kidneys from 2s. to 2s. 6d. per bushel. It is a pleasure to take an article to market for which there is a good demand, let the price be high or low. But somehow we do not like to show samples of good red wheat, weighing 61lbs. per bushel, and get an offer of 40s. per qr., or something less, for it. We may here enquire how it is that when wheat is 8s. to 10s. per bushel, the demand is invariably greater and business more "cheerful," than when it sells for 5s. or 6s. per bushel. We never could quite understand the reason, so far as regards the demand, though there is no doubt of the fact. One would naturally suppose that the high price would check consumption, and the low price tend to increase it. There is no life in the wheat trade now, and the growers' sole comfort is in his productive crop and fine quality. Prone as farmers are said to be to grumble, we hear of no grumbling this year respecting the yield of wheat. Barley also turns out well, but the quality is various, the price ranging from 25s. to 40s. per qr. There is no fear of fine barley being cheap, so much of the present year's crop having suffered from the rain in the latter part of harvest, and a great lot of barley is only fit for grinding. Store sheep are cheaper, in consequence of the poor prospect for winter food; and cattle are also easier to buy. Cart colts are a drug in the market, and it is a long time since young horses have been so cheap. There is, indeed, a drop in all live stock excepting fat stock, and such maintains a comparatively high price. Even the fancy shorthorns, whose pedigrees puzzle the uninitiated, are not realising the money they formerly did; and we have noticed that no herd sold this year has come up to the Bushey Grove average of October 1, 1862. We regret the dispersion of the Bushey herd, for a bull was frequently at the service of a farmer, and many a good animal has been the result of the cross.—Oct. 24.

DERBYSHIRE.

The glorious summer of '63 has passed away; and now, in looking back, we recount its many pleasing aspects. Surely such a productive season was needed. Our stocks of grain getting low, and a population none too well employed, seemed to require all the mercies bestowed on them. The harvest at the commencement was accompanied with fine dry weather, and in all the early districts the corn was secured in first-rate condition. About mid-harvest, however, just when those in the later localities were anticipating the same pleasing consequences, down came the rain, and all the remainder of the season was of the most perplexing kind. In the later districts the grain was sprouted more or less, and all the expedients of the year '60 was resorted to to secure it. The result was the bulk very badly got, and scarce a sheaf fit to thrash for some time. The needy farmer was in trouble at once: he wanted money, and nothing to sell but soft, unsound grain. So much for the uncertainties of a farmer's life. Our pastures are well stored with grass, and there seems abundance everywhere. The turnip crop has improved very much the last two months, and may be said to be an average one. The injury done to the corn by the rains was a saving of the turnip crop, which must have been light had not the rains fallen as they did. The mangel wurzel crop is again light. It has become with some a bye-word—"fancy article." We think the proper mode of culture is not sufficiently understood. It is a plant requiring a fair quantity of salt using at various stages of its growth; and without which it is doubtful in the Midland districts. The ground should be cleaned and manured in the autumn, and the seed dibbled in early in the spring. As soon as the plants appear, they should have a dusting of soot and guano mixed, thrown broadcast over the ground, and horse-hoed at the same time. The same process should be repeated every fortnight while the size of the plant will admit, and then you may expect a full crop. Better abandon the growth than be stingy with the manures. The potato crop is mostly got up, and a very abundant one. Since the

heavy rains, some complaint of disease; but we think without much cause. All kinds of farm work is in an advanced state, and a good breadth of land has been sown with wheat. The inquiry for seed is considerable. The varied seasons produce such contrary results. At one time we had the farmers inquiring for what they called "fil strike," the wheat with the large coarse grain called "Spalding," &c. These kinds of wheat did well enough with fine dry seasons; but when 1880 came with its drooping sky, the large berries all heaved and sprouted, while the Lammas small-grained varieties came into favour. The Nursery, Dunstable, Lammas, and Old Red—grain very much of one shape—is now wanted. The Nursery variety is quite a favourite with the miller, and there will be a good quantity sown. Our cheese fairs have been very satisfactory ones to the producers, and the values a shade higher than the purchasers expected: most of the lots offered have been sold. Our store stock markets have been dull without much alteration in value. If the adage of "down corn, down horn" is anything to be relied on, there must be a strong reaction; for corn is down enough. Fat stock, though plentiful, is not much altered in price. It is and must be the farmer's stronghold; and until he adopts the maxim of making his payments from live stock, he will always be liable to disappointment. We want England to be a great meat-producing country: its corn will come as a consequence; and the more corn the foreigner sends the better for the soils of England eventually. Whatever he exports we import, and so much we should add to the fertility of the soil. Necessity is often fraught with good. May the necessities of the farmer tend to that end! Our corn markets are very amply supplied, and wheat, especially, is very low: from 36s. to 40s. per qr. for red is about the general run. The wheats gathered in the rainy period is some 5s. per qr. below the sound, dry varieties. So much must the clay-land farmers suffer. The season for the hiring of servants is at hand. When will this remnant of feudalism disappear?—a modified slave market held annually in free England! With all our contriving powers, cannot we devise something better? some mode of engaging labour without the humiliating act of an open market. There must be something wrong with both the employer and employed. Surely the system will become obsolete. Labour becomes more plentiful, and wages are getting lower. In purely farming districts the employer pleads the value of corn as a reason: we should say straitened circumstances.—Oct. 23.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ALCESTER FAIR.—There was a large attendance of buyers, but the supply of sheep was unusually small, though the supply of beasts was somewhat larger in proportion. There was a large number of pigs, but very few horses. Beef fetched 6½d. to 7d. per lb., mutton 6½d. to 7½d.

ASHBOURN FAIR.—For the best colts and good horses for agricultural purposes there were customers, while midding and inferior sorts were almost unsaleable. The show of store cattle was more numerous; of fat cattle about an average supply; prices lower. The best in-calvers and barren cows were easily sold, inferior sorts being dull of sale. There were a great many sheep penned, both store and fat: also a good show of lambs. Prices lower for all sorts. The show of rams was about as usual, and there were some very good ones, which met with an extremely dull sale. Beef made about 6d., sheep 7d. to 7½d.

AXMINSTER FAIR.—The prices of stock may be quoted as follows: Fat beef from 10s. to 11s. per score, barreners from 6s. to 7s., cows and calves from £12 to £16, one and two years old heifers from £6 to £8 each, bulls from £6 to £12. Sheep: Horn ewes from 35s. to 45s. each, down and cross-bred ewes from 30s. to 40s., fat sheep from 6d. to 7d. per lb., horn lambs from 22s. to 30s., down and cross-bred lambs from 22s. to 28s. Pigs were in good supply, but prices were inclining downwards, a pig lately worth 25s. now only fetching about 20s.; good hard slips 11s. to 12s. each, large pigs from 25s. to 30s.

BRENTWOOD FAIR.—There was a good supply of horses for agricultural purposes, for which there appeared a

ready sale. Cattle was also in good demand, and some beasts in excellent condition fetched from £16 to £20 per head.

COLCHESTER FAIR.—There was a large show of cattle, but the horses were not so numerous this year. Mr. W. Martin, of Cattawade, showed forty useful horses and colts, which fetched—two to three years old colts from £25 to £32; five to six years old horses from £25 to £40, mares from £25 to £40. Mr. W. Keys, of Heybridge, showed thirty first-rate working horses and colts, which fetched from £25 to £45. Many of the horses sold, but the trade was not brisk. Mr. H. Fenner, of Colchester, had a drove of thirty Welsh ponies, which sold at from £5 to £15. Mr. J. Fenner, of Dedham, had £800 beasts, North Welsh, from £8 to £10, shorthorns £15. Messrs. S. and F. Johnson, of Lavford and Elmsted, had some polled Scots at £17, shorthorns from £8 to £17, runs from £7 to £10 10s. Beasts were no cheaper, and trade rather dull. Mr. R. Johnson, of Myland, had some half-bred keeping sheep at 44s. 6d., lambs 35s.

DEVIZES FAIR.—There was a tolerably large supply of sheep and lambs, the majority of which were, however, in poor condition, and trade ruled very flat, though before the close of the fair nearly everything was cleared off. Mr. F. Lavington refused £8 10s. a head for a pen of fat sheep, for which he asked £4. Prices may be quoted at about the closing prices of the late Weyhill fair—ewes 34s. to 44s., this latter sum being realised by Mr. Biddle; lambs 28s. to 32s., culs 18s. to 24s. Cattle were not in large supply, and here the trade was not brisk, prices being somewhat on the decline, good grazers making £12 to £16, yearlings £8 to £8, calves £3 10s. to £4, working oxen £17 to £21; fat beasts 11s. 6d. per score. Horses were, as usual, more numerous than at most, and found scarcely any sale; a few colts, however, changed hands, otherwise only a nominal business doing.

GAINSBOROUGH FAIR was one of the largest we have had for some years, the show of sheep especially being very great. There was a brisk demand, and everything useful found purchasers at high prices. Lambs ranged from 30s. to 40s. A few of superior quality made 42s. to 44s. Topping ewes 40s. to 50s. Wethers 50s. Fat sheep 6½d. to 7d. per lb. One to one-and-a-half year old steers £8, two to three years old £10 to £16. In-calvers £16 to £18; fat beef 7s. to 8s. per stone. Drapes made good prices. There was an average show of horses, but the bulk were of an inferior description. Carting horses made from £25 to £30, and mares from £15 to £20. Other sorts, including Irish, at any price.

GLOUCESTER MONTHLY MARKET.—Good beef sold readily at former prices, while inferior was disposed of at a reduction. Sheep of good quality were in demand, and met with ready customers at fully last market's quotations. Beef from 6d. to 7d., mutton from 7d. to 8d. per lb., pigs from 9s. to 9s. 6d. per score. At these rates almost an entire clearance was effected.

HEREFORD FAIR.—Fat beef realised 6½d. to 7d. per lb., and the prices of all kinds of stock for fattening purposes had an upward tendency. The supply of cattle was small in comparison with previous years, and, for the better class of animals for meat, was not equal to the demand. Among the largest purchasers was a Mr. Whitehouse, a name new to us here. The prices obtained were on the whole satisfactory to the seller, and anything of good quality sold well. In reference to the small supply of stock (which has been a subject of perplexity to many persons), we believe that it is to be accounted for by the fact of very extensive purchases having recently been made by our large dealers. Last week, for instance, we understand that no fewer than a thousand head of cattle were sent off as part of these purchases. There was a brisk demand for wethers, of which there was not a large supply, at from 7½d. to 8d. per lb. Ewes were quoted at 7d. per lb. Pigs were rather cheaper. In the horse fair a few of the best changed hands.

LUDLOW FAIR.—There was a small supply of fat beasts, and a still smaller supply of purchasers. Beef fetched from 6½d. to 7d. per lb.; store beasts seemed plentiful, and sold at fair prices; fat wethers, of which there were but few, fetched from 7½d. to 8d. per lb. The sale of pigs was rather brisk. Very little done in horses.

MARKET HARBOUROUGH FAIR.—The horses were generally of an inferior kind. There was a large number of beasts, but not so great as on previous years. Fat beef realised from 5½d. to 6½d. per lb. Steers from 11s

to £18, milchens £14 to £21. There was only a moderate supply of sheep, and trade was rather dull.

MUIR OF ORD MARKET.—The supply of sheep was little more than half the number at the corresponding market last year, there being only 6,389, while last year there were over 12,000. There was a brisk demand for Cheviot wethers, but Cheviot ewes and blackfaced wethers, hogs and ewes, met with a stiff sale. Cheviot wethers may be quoted at from 26s. to 28s.; but some lots were sold as high as 34s. 6d. Cast ewes averaged from 18s. to £1. There was a large supply of cattle, but by far the greater part were of middling and inferior quality. Good beasts were in great demand at high prices, but others went off very stiffly. Calves also were greatly in request, and good prices were got for them.

PENNYMUIR EWE AND WETHER FAIR.—The number of sheep would be between 6,000 and 7,000 head. Sellers began by asking high prices, and some of the lots were bought even at the extreme prices asked; but a stiffness pervaded the market throughout the entire day, buyers being of opinion that the money asked was too extravagant. Cheviot ewes were a very dull sale, and expositors of this class of stock had to reduce their prices before bargains were struck. Cheviot wethers, on the contrary, were in demand, and high prices were realized for them. The top price obtained for wethers was 38s. Mr. Robson Scott, Letham, sold his two years old wethers at 34s. Mr. Smith, Flacup, sold his two years old Cheviot wethers at 31s. 6d. Mr. Shiell, Sourhope, sold his two years old Cheviot wethers at 31s.; and his Cheviot ewes at 28s. 5d. Mr. Riddell, Calroust, sold a lot at 27s. The Old Town Cheviot wethers were sold at 37s. The Plenderleith Cheviot ewes brought 29s. 6d. The current prices ran from 25s. to 29s. 6d.; and shots were selling at from 15s. to 25s. 6d. Cheviot wethers were selling at from 27s. to 38s. There would be a rise on last year's prices of from 1s. to 1s. 6d., but on the prices from recent markets there was a small decline. Several good lots were taken home unsold.

WINCHESTER FAIR.—The supply of Sheep was unusually short. An average is computed to be 30,000; but on this occasion there were barely 20,000—a full third deficient—in a great measure to be attributed to the sudden outbreak of epidemic lameness, which during the last fortnight has presented itself in an alarming form throughout the southern and south-western parts of the county. Many pens taken a few days since found no occupants, the sheep being unable to hobble off the farm they are feeding on. Notwithstanding the very short supply, the trade was dull and dragging during the early part of the day, but ultimately the business became quicker, and the whole were disposed of in about two hours, at prices varying but little from the late Weyhill fair. The following were the general prices: Ewes 35s. to 45s., extra lots 48s. to 50s., lambs 25s. to 29s., extra 40s. to 44s., wethers 40s. to 52s. each. The show of horses was a full average, the whole of which met a very dull sale, and inferior descriptions were unsaleable. Cart colts £20 to £30, agricultural horses £15 to £27, extra quality £30 to £33, nag horses £12 to £25, superior £30 to £45; in-calf cows £9 to £11, heifers £5 10s. to £7 10s.; fat hogs 8s. 6d. to 9s. 6d. per score; store pigs a dull sale, at lower prices.

WOOLER FAIR.—High prices were asked in the morning, but during the forenoon expositors of stock had to give way a few shillings as they could be converted into cash. The best lots were considered well sold, although in most instances prices were down from former markets. At the close a large number of lots were taken home unsold. Among the sales of Leicester diamonds, the highest prices realized was 53s. 6d., which were purchased by Mr. Wood, Berwick. Mr. Boyd, Doddington, sold a lot of Leicester sheep at 47s. Mr. Hunt, Thornton, sold a lot of the same description at the same money. A lot of Leicesters were purchased by Mr. Kennedy at 46s. Mr. Elliot, Akeld, sold a large lot of half-bred sheep at 46s. The Brandon lot of Cheviot wethers brought 38s. Mr. Thompson, Kirknewton, sold Cheviot ewes at 28s., and his half-bred diamonds at 34s. In the cattle market the show was large, with a brisk demand at prices much about those of recent markets. Large lots of feeding cattle were picked up by farmers who have at present a plentiful supply of meat. The best lot of feeding cattle were sold by the Messrs. Stott, dealers, Newcastle, at £18 10s. Mr. Robertson, dealer, sold a lot of steers at £16 10s., and a

lot of heifers at £16. Mr. Foster, dealer, sold stirks at £10 and £8. Mr. Ruddich, dealer, sold a lot of two years old at £11 10s. A large lot of stirks were sold to go to Berwick at £9 10s. Horses were considerably down in price, with a dull demand. Draught horses were selling at from £40 to £12, while saddle and harness horses were an indifferent sale, and could scarcely be cashed.

SALE OF THE MONAUGHTY HERD OF HEREFORDS.—The sale of this celebrated herd of Hereford cattle, the property of the representatives of the late Mr. James Beauchamp, took place on Thursday, Oct. 23, and was conducted by Messrs. Russell and Son, Mr. Russell, sen., wielding the hammer with an ability equal to the great occasion. There was an immense assemblage of the patrons of the "white-faces" from all parts of the kingdom, including her Majesty's representatives from the Royal farm at Windsor, and the Duke of Bedford's agent. Luncheon was provided in the spacious tent of the Leominster Horticultural Society, and was partaken of by several hundred persons. The sale was a very good one, and for some of the "gems" high prices were realized, as for instance, Duchess of York, 40 guineas; Diana the Second 85 guineas (purchased by Mr. Far, of Pontillas); her bull-calf, 57 guineas (Mr. Jackson, Blackbrook, near Monmouth); Spangle the Second, 65 guineas (Mr. Baldwin, Luddington); her bull-calf, 77 guineas (Mr. Wheeler, Kyrewood, Tenbury); Deception, yearling bull by Sir Benjamin, 80 guineas (purchased, as well as the Duchess of York cow for the Queen). Great inconvenience was occasioned by the nonfulfilment of the announcement, "by order," that a special train would leave the Craven Arms station on the arrival of the early train from Hereford, and the denunciations against the railway authorities were neither few nor mild.—*Hereford Times*.

SALE OF THE LATE EARL BEAUCHAMP'S STOCK.—The sale of the Madresfield surplus stock took place a few days ago, and brought together a very large number of people from all quarters. The hunters sold well, a bay gelding, Cartals, seven years old, fetching 166 guineas. Fat sheep ranged from 31s. to 49s., Leicester ewes and lambs from 25s. 6d. to 44s. 6d., Southdowns 21s. to 31s. £42 was the highest price given for shorthorn cows; shorthorn bulls £22 to £38; Devon cows £18 10s., heifers £12 10s. to £13 each.

SALE OF THE LATE SIR TATTON SYKES'S STOCK AT SLEDMERE.—The last of the series of important stock sales, consequent upon the decease of the late baronet, was held by the Messrs. Boulton, at Sledmere, on Wednesday, Oct. 7. As upon previous occasions, the attendance was very large, and included the most noted breeders of stock in England. The prices realized were even more remarkable than upon the previous occasions. The horned cattle were first sold, commencing with the Highland bullocks, chiefly bought for Lincolnshire, at an average price of 11l. per head—estimated over 10s. per stone. A brisk competition ensued for the renowned short-horned cows by Rhodens. Strawberry fetched 33l. 15s. from Mr. Dickinson; and Gaymaid and Rose, respectively 28l. 15s. and 25l. 5s., for the Beaulieu herd. The heifers averaged about 22l. each. The two-year-old steers made nearly 20l. each, and the heifers of the same age over 22l. average. The yearling steers and heifers made an average price of 12l. Very few of this stock remain in the neighbourhood. The sale of the Leicester tup lambs aroused an extraordinary amount of competition. The highest price realized was 16l. from Mr. Thompson, of Kandal, Westmoreland; and Mr. Stamp, of Highfield House, Nunnington, was the next buyer of importance. During the last few days the latter gentleman has also bought the prize gimmers of Mr. S. Wiley, which won at the Yorkshire Show, and wherever else they have been shown. Close upon these gentlemen followed Mr. Bennett, of Ragby; Mr. Pollister, Bedale; Mr. Riley, South Dalton; Mr. Aitchinson, Alnwick; Mr. Ringrose, Flinton; Mr. Stables, Ulverston; Mr. Garnett, Otley; Mr. Angus, Newbick; and other well-known names as breeders. These were all purchasers of tup lambs, of which nearly 150 were sold, realizing an average of over 8l. per head. The competition for the gimmer lambs was scarcely less surprising. In this stock also, Mr. Thompson, of Kandal, outbid all his opponents, giving as high as 8l. 5s. per head for some of the pens. There were numerous other sales at 5 guineas per head; and the whole flock realized an average price of over 8l. 10s. per head. As with the tups, nearly all these go out of the county.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The month of October has been much beyond that of September as respects temperature, having proved warm throughout, and though the earlier part was showery the last fortnight was mostly fine. There has, therefore, been a more favourable time for the late northerly districts of Scotland and Ireland than at one time feared, but more disease has become apparent in potatoes. The wheat trade throughout the month has been quiet, without quotable change of value, with more firmness at the close. The averages, however, show some decline, which must be more attributed to a falling off in the condition than any real reduction in the value of fine samples. Contrary to the general course of things, old samples have continued of less value than new, and millers in want of such have availed themselves of the use of foreign in preference to our own crop of 1862; and though, for a productive harvest, our imports have continued liberal, no depression has occurred in prices; but, unfortunately, all imports have been losing money heavily, as the result of operations when a higher range obtained. With, however, the incessant fluctuations of New York, and more limited arrivals there from the interior, it is not to be expected that American supplies will be so abundant as heretofore; and should farmers hold back a little more, we may see some improvement on the present very low prices, the average having sunk down to 40s. 4d. per qr., while the quality is 2s. to 3s. per qr. above ordinary seasons. But there seems no speculative spirit yet abroad, and if the rise is left to millers, without some political mishap, it may be slow work. Our seed time has again been favourable, the dryness of the subsoil soon clearing off the superabundance of moisture above. Much has been safely planted, and that first in the ground looks all that could be desired, and with the high temperature still prevailing we may generally expect a good show of strong plants before Christmas, capable of bearing a few rough months before the spring growth. The Continental reports of the crops gathered continue favourable, as well as for the autumnal tillage; but later accounts from Canada have not been very flourishing respecting the yield of the last crop, especially of the spring wheat, from previous drought and the ravages of insects. The public are now reaping the benefit of a bountiful harvest in the consumption of cheap bread of a far better quality than of late, and, if the blessing of peace be preserved, ought not to grudge Agriculture some recompence for its incessant toil and anxiety. The following prices were recently current at the several places named: Fine French new wheat at Paris was worth 43s. 6d. per qr., with some as low as 39s.; Pomeranian wheat at Antwerp was worth 45s. to 46s.; new wheat at Maestricht brought 42s.; Wahren and Mecklenburg at Hambro' the same. The best new Danzig was offering, cost and freight

to London, at 47s. to 48s., extra fine old to 50s.; new at Cologne 41s., old 40s.; native wheat at Venice 41s. 6d.; the quotation for the best quality at Straubing was 41s.; wheat at Galatz was quoted 32s.; Saidi at Alexandria, 23s.; Bubi, 34s. At Montreal spring wheat was worth 30s. 5d., Chicago, 29s. 11d. per qr. of 480 lbs. Incessant fluctuations at New York made prices unreliable, but the rates last quoted were 28s. 6d. for spring wheat, new Western 30s. 6d., and choice white Kentucky 39s. per qr. of 480 lbs.

The first Monday commenced on good English supplies of wheat, with fair foreign arrivals, chiefly from America. But few samples appeared this morning from Kent and Essex, but millers were very careless buyers at the rates of the previous week. Foreign was in very moderate demand, and the prices realised were the same. More was doing, however, in floating cargoes at unaltered rates. The weather having been damp and warm, much of the wheat exhibited at the several markets was out of order, and lower prices for such were taken, as at Stockton and Bury St. Edmund's, but Spalding was rather dearer, Hull, Spilby, and Oakham being firm. Tuesday's market at Liverpool experienced a better demand for wheat at fully as much money, and prices were sustained on the following Friday. No alteration was noticed at Edinburgh, but at Glasgow American samples were down 3d. per boll. In Ireland there was no quotable change, the turn being rather in favour of sellers at Dublin.

The second Monday began with less English wheat, but a considerable increase of foreign. There was another small show of samples during the morning from the near counties. White went off pretty well at unaltered rates, but red hung on hand, its small quantity alone saving it from a decline. The liberal supply from abroad, including great varieties from the Continent and America, made buyers limit their purchases of such to their immediate wants, the former rates being paid in retail for old, but new wheat being soft was rather cheaper. With diminished arrivals off the coast, former prices were paid. With a damp warm atmosphere still prevailing, the wheat trade in the country was sluggish, without quotable variation in prices, but there were some markets pretty firm, as Hull, Ipswich, Barnsley, Rugby, Melton Mowbray, and Gainsborough. Liverpool found an animated demand on Tuesday, 1d. to 3d. per cental more being paid on American wheat, but Friday relapsed into dullness. The Scotch markets were little altered; Glasgow was without change, but damp wheat at Edinburgh was down 1s. per qr. Dublin was rather dearer for native wheat, and firm for foreign.

The third Monday began with the English supply further reduced, and not so much foreign was reported. Another short supply was noted on the

Kentish and Essex stands. White wheat continuing in favour, went off without quotable change; but red, in consequence of the quantity of American on show, was rather cheaper to sell, being but little wanted. The foreign trade remained very limited, only good old and useful dry parcels being in demand, and these about maintained their former value. In cargoes afloat a fair trade was transacted at the previous currency. But little difference of value was noted this week in the country markets. Several evinced more firmness, as Hull, Leeds, Spalding, Wolverhampton, and Rochester; but as many were dull, in consequence of more samples wanting condition, and in these cases rather lower rates obtained. Liverpool was rather dearer for good American on Tuesday, but Friday's market was dull. In Scotland and Ireland there was very little change.

The fourth Monday opened on a moderate English and plentiful foreign supply. The near counties again sent up but few samples for sale, which, however, only went off slowly at the former quotations. For foreign of good dry useful descriptions there was rather more demand, at fully the previous rates; and floating cargoes obtained rather more money. Some of the country markets were brisk this week for fine quality wheat, and generally there was more confidence in prices. Glasgow and Edinburgh obtained about previous rates, and so did most of the Irish markets.

The imports into London for the four weeks were—32,800 qrs. English, and 101,540 qrs. foreign, against 25,069 qrs. English, 180,873 qrs. foreign, for the same period in 1862. The imports into the kingdom for the same time were—574,457 qrs. wheat, 436,320 cwt. flour. The exports from London were only 108 qrs. wheat, 571 cwt. flour.

The flour trade during the month has been very calm, though foreign imports for two months have been moderate. Country-made samples have been a slow, dragging trade, without quotable change as to values. So have American barrels, none but fine qualities going off readily, and then only in retail. For moderate descriptions only 20s. per barrel have been paid, and the bulk in warehouse is of this kind. Town millers have not lowered the top price, 43s. being still paid, though high in comparison to the price of wheat, and foreign as well as country-made flour; and should wheat not find some reaction upwards, the probability is that rates will be reduced. The imports into London during four weeks were—67,984 sacks English, 2,229 sacks 4 4,294 barrels foreign, against 62,447 sacks country, 11,155 sacks 62,773 barrels foreign for October, 1862.

The barley trade has been heavy, and fully 1s. to 2s. per qr. cheaper for all but the finest malting, which has appeared in such small quantities that it has constantly gone off at full prices, leaving the inference that not much is likely to find its way to the London market; and the fine French and Saale qualities have effectually hindered the sale, and lowered prices, of secondary sorts, really good and fit for malting having been sold at 32s., while 53lb. grinding has finally brought only 27s. per qr. As cargoes of the low eastern quality are now

likely to arrive, and meet the inferior sorts from the Baltic, a rally cannot for the present be expected; but the best qualities seem likely to remain at a high range. The imports for four weeks were—24,950 qrs. British, 46,416 qrs. foreign, against 12,198 qrs. British, 14,864 qrs. foreign, in 1862, showing that, in consequence of an earlier harvest, our home growth has been doubled, while foreign arrivals have more than tripled in the same time.

After a long continuance of heavy losses in foreign oats, liberal supplies have still been the order of the day; but these imports, consisting mostly of new from Sweden, Denmark, and the Baltic ports, in poor condition, have greatly oppressed the market, some on arrival turning out thoroughly hot; and these have been forced off at low and irregular rates. Even the best qualities have been rather lowered; but sweet old Russian, now getting scarce, seem to have reached their lowest; and should supplies become more moderate, we may see some reaction on the very low prices of this grain. Riga have been selling at 16s. 6d., and Swedes of fair weight at 18s. Some of the new Irish have proved of very fine quality, but cannot be valued over about 22s. per qr. The imports for four weeks were—in English qualities 24,749 qrs., Scotch 2,352 qrs., Irish 9,329 qrs., foreign 186,218 qrs., against 43,932 qrs. English, 90 qrs. Scotch, 2,821 qrs. Irish, and 102,031 qrs. foreign, for the same period in 1862.

Beans during the month have been much depressed, and new of home-growth have given way 2s. to 3s. per qr., though the supplies have been by no means large. The extreme warmth of the weather appears greatly to have diminished the consumption, and this fall has influenced old foreign about 1s. to 2s. per qr. downwards. Lower rates have prevailed in Egypt since the discouraging advices hence, the highest quote being now 25s. 6d. per qr. at Alexandria. As the corn is said not yet to have been hurt by the excessive rise of the Nile, we may yet see lower rates; but the price now paid for English new mazagans, say 28s. per qr., may induce farmers to lessen their offers. The imports for four weeks were 6,329 qrs. English, 8,514 qrs. foreign, against 3,411 qrs. English, 4,925 qrs. foreign in 1862. So that quantities, without assuming large dimensions, have really doubled.

Peas have also participated in this dulness and decline from the same cause. White boilers of fair quality have been quite a drug, some only bringing 36s. per qr.; while maples, though reduced, were still worth 37s., grey 34s. to 35s. The English arrivals have been pretty free, the foreign but scanty, and for the four weeks stand thus: English 5,689 qrs., foreign 1,745 qrs., against 3,073 qrs. English, 3,003 qrs. foreign for October, 1862.

The linseed trade has been firm and steady throughout, the demand, notwithstanding present high rates, being quite up to the moderate supplies, which do not seem likely to increase much. Cakes have gone off freely at fully as much money.

The seed trade has been in calm, with the single exception of canaryseed, which, from the failure of the English crop, has been rapidly rising, gaining

more than 10s. per qr. in the month. It has been the reverse with cloverseed, the speculative inquiry being checked by more favourable accounts of the new crop in France, and lower rates in consequence. Some fine new red English has been exhibited, for which high rates were asked; but business cannot yet be said to have commenced. Winter tares have sunk to 4s. 6d. per bushel.

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Sept. 12, 1863	44 1	34 7	21 8	31 0	39 10	35 10
Sept. 19, 1863	44 9	35 2	20 9	31 7	39 0	36 9
Sept. 26, 1863	43 9	35 9	20 3	32 1	38 11	37 5
Oct. 3, 1863	42 2	35 4	19 8	31 0	37 11	36 7
Oct. 10, 1863	41 0	34 7	19 4	31 5	37 0	36 4
Oct. 17, 1863	40 4	34 0	18 8	29 2	36 5	34 7
Aggregate Average	42 8	34 11	20 1	31 1	38 2	36 3
Same time last year	52 2	35 9	22 9	35 1	40 3	41 2

COMPARATIVE AVERAGES—1863-62.

From last Friday's Gas.	s. d.	From Gazette of 1862.	s. d.
Wheat	9819 qrs. 40 4	Wheat	83717 qrs. 48 11
Barley	88461 .. 34 0	Barley	51414 .. 34 5
Oats	11910 .. 18 8	Oats	34518 .. 21 7
Rye	451 .. 29 2	Rye	233 .. 34 8
Beans	4754 .. 36 5	Beans	3094 .. 39 1
Peas	1722 .. 34 7	Peas	1596 .. 42 5

PRICES OF SEEDS.

BRITISH SEEDS.

MUSTARD, per bush., white	9s. 6d. to 10s.
CORIANDEE, per cwt.	14s. 16s.
CANARY, per qr.	46s. 56s.
TARES, winter, new, per bushel.	5s. 5s. 6d.
TRIFOIL	24s. 27s.
LINSEED, per qr., sowing —s. to 74s.	crushing 68s. 68s.
LINSEED CAKES, per ton	£29 10s. to £10 10s.
RAPESEED, per qr	62s. to 65s.
RAPE CAKE, per ton	£5 10s. to £6 0s.

FOREIGN SEEDS.

CLOVERSEED, red —s. to —s., white	—s. to —s.
HEMPSEED, small —s. per qr., Dutch	—s. 48s.
TRIFOIL	22s. 24s.
CARRAWAY	—s. —s.
CORIANDEE, per cwt.	16s. 18s.
LINSEED, per qr., Baltic 58s. to 60s.	Bombay 68s. —s.
LINSEED CAKES, per ton	£29 10s. to £11 0s.
RAPESEED, Dutch	—s. to —s.
RAPE CAKE, per ton	£5 6s. to £6 0s.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Oct. 26.—The arrivals of Potatoes to these markets are still chiefly confined to the home-growth, but they are of fair average extent. On the whole, the trade rules steady, and, compared with our last report, the changes in prices are unimportant. The currency is as follows:—

Kent and Essex Regents ..	60s. to 80s. per ton.
Ditto Flukes	70s. to 90s. "
Ditto Rocks	50s. to 60s. "

COUNTRY POTATO MARKETS.—DONCASTER, (Saturday last): A good supply of potatoes, which met a fair demand at the following prices: Wholesale 5s. to 6s. per 18 stones, retail 6d. to 7d. per peck. MANCHESTER, (Saturday last).—Potatoes 5s. 6d. to 9s. per 252lbs.

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.—	s. d.	CHEESE, new, per cwt.—	s. d.
Friesland	114 to 116	Cheddar	60 to 74
Jersey	90 104	Double Gloucester	60 66
Dorset	110 118	Cheddar	64 78
Carlisle	94 106	American	44 54
Waterford	56 106	HAMS: York	94 104
Corb., new	96 106	Cambridge	94 104
Limerick	90 106	Irish	78 90
Sligo	94 106	BACON: Wiltshire, dried, 70 74	
Fries, per doz. 12s. 6d. to 15s. 6d.		Irish, green	60 64

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Oct. 26.—Our trade is good, and, for the best quality, more money is obtained.

Dorset, fine	120s. to 122s. per cwt.
Do Middling	Nominal.
Devon	112s. to 116s.
Fr. h	12s. to 15s. per doz. lbs.

WOOL MARKETS.

ENGLISH WOOL MARKET.

CITY, MONDAY, Oct. 26.—Since our last report a fair average business has been transacted in nearly all kinds of home-grown Wool, and the quotations have been well supported. The supply on offer is only moderate. A public sale of about 1,800 packs will be held in London on the 4th proximo.

CURRENT PRICES OF WOOL.

ENGLISH (per lb.)			
s. d.	s. d.	s. d.	s. d.
Middle hoggets 1 10½ to 1 11½	Combing skins 1 6½ to 1 7		
Ditto wethers 1 8½ to 1 9½	Carding ditto 1 5 to 1 6		
Hf.-bred hoggs 1 9 to 1 10½	Head ditto 0 10 to 1 1		
Down tags 1 8 to 1 9	Wells 1 1 to 1 2		
Down ewes 1 7 to 1 8½	Brooks 1 1 to 1 2		
SCOTCH (per 3 lb.)			
s. d.	s. d.	s. d.	s. d.
Laid Highland 17 0 to 18 0	Laid Cheviot 30 0 to 30 0		
White ditto 19 0 to 21 0	Laid Cross 18 0 to 21 0		
	White Cheviot, 34s. to 42s.		

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS, (Friday last).—The consumption of English Wool in the worsted districts is kept up, and prices are in favour of the seller, without any immediate prospect of being lower. The cloth manufacturers are well employed, and the stocks of colonial Wool are not pressing heavily on the market. Prices are unaltered.

LIVERPOOL WOOL MARKET.—Oct. 24.

SCOTCH.—There continues only to be a retail demand from the trade for immediate requirements. Stocks are on the whole light, and holders firm.

		s.	d.	s.	d.
Laid Highland Wool per 24lbs.	17	6	to	19	6
White Highland do.	21	0		31	0
Laid crossed do. unwashed....	20	0		21	0
Do. do. washed	21	0		23	0
Laid Cheviot do. unwashed....	23	0		25	0
Do. do. washed	26	0		31	0
White Cheviot do. washed	33	0		44	0

GLASGOW WOOL MARKET, (Saturday last).—The demand for wools in this market continues good, and prices are fully maintained. In all classes good clips are becoming scarce, and what is on hand is held for full rates. Cheviots are in good request, especially full-grown clean wools. Black-faced laid and white mixed with a ready sale, especially combing wools. Stock of all kinds are getting into narrow compass.—F. H. M'LEOD.

WOOL—FRANCE.—A certain animation has appeared of late in the French markets. At Havre, wools in a dirty state have been much sought after. Buenos Ayres wools have been sold in a dirty state at 4s. 3d. per kilogramme (the fiftieth part of an English cwt.), and wools in a dirty state from La Plata have sold at 2s. 6d. to 4s. 3d. per kilogramme, according to quality. At Marseilles some animation prevailed early in the month, but latterly affairs have been feeble. This difficulty is attributed to the tenacity of sellers, who refuse to cede goods below their purchase price. White washed Orinasse wool has sold at 1s. 8d. to 2s. 150 bales of Kabyle have found buyers at 1s. 5d., and 68 bales of Caracul at 2s. 3d. per kilogramme.

MANURES.

LONDON, Oct. 23.—The demand for Manures for Wheat sowing is very good. Oilcakes are still dull of sale. Rape Cake, both for feeding and manure, is in better demand. Prices of the raw material remains unaltered.

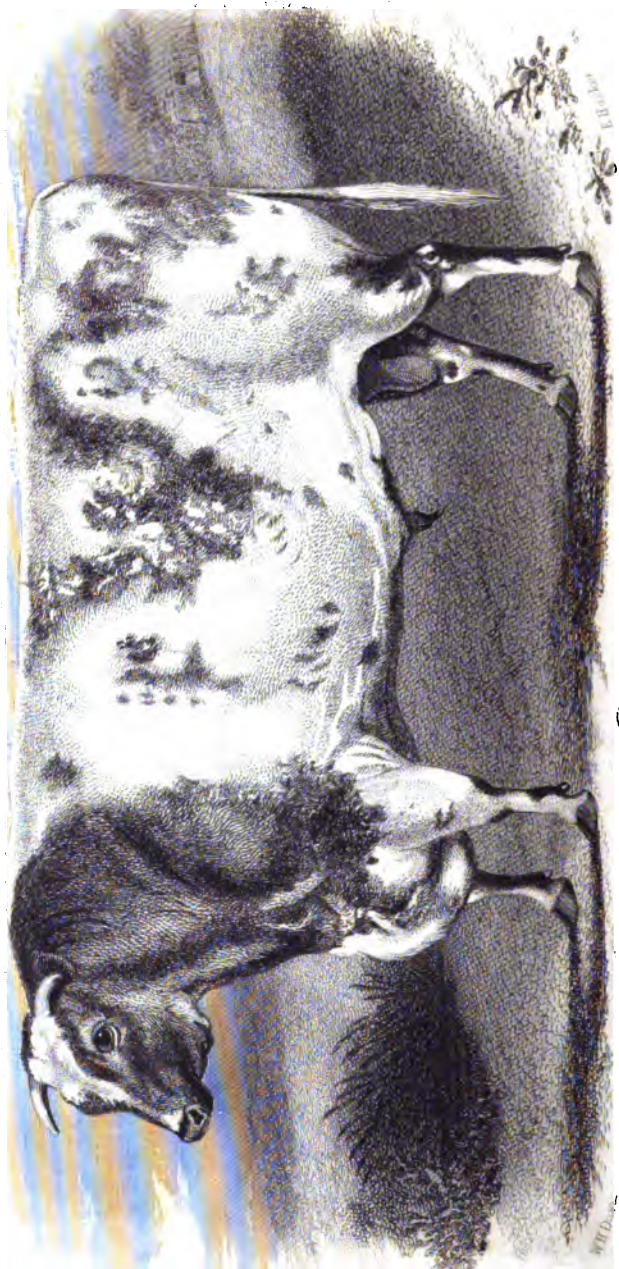
PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from the importers' stores, or ex ship (30 tons) £12 5s. p. ton; under 30 tons £12 10s.
Bones, £5 5s. p. ton; crushed, £4 10s. p. ton.
Animal Charcoal, (70 per cent. Phosphate) £3 to £3 5s. p. ton.
Coprolite, Cambridge, ground £3; Suffolk, £3 10s. to £3 15s. p. ton.
Waste of soda, 16s. p. ton.
Sulphate of Ammonia, 15s. p. ton.
Gypsum, 30s. p. ton. Superphosphate of Lime, £5 10s. to £5 15s. p. ton.
Sulphuric Acid, concentrated 1-945 l. p. lb., brown 1-719 6d.
Blood Manure, 47 10s. p. ton. Dissolved Bones, £3 15s. p. ton.
Mashed Cakes, best American, £10 10s. to £10 15s. p. ton; also £1 15s. to £10 15s. p. bag; English, £10 to £12 10s.
Rape Cake, £5 5s. to £5 15s. p. ton.
Cottonseed Cake, £5 10s. to £5 p. ton.

E. PURSER, London Manure Company.

116, Fenchurch Street, E.C.

Printed by Rogerson and Tuxford, 245, Strand, London, W.C.



The Duke of Fyne

Property of Mr. James Wilson of Menzies House, Woodhouse, Yorkshire, and the best Friesian bull in England.
 The Friesian being the best of England, July 1840.

PLATE V.

THE DUKE OF TYNE; A SHORTHORN BULL,

LATE THE PROPERTY OF MR. JACOB WILSON, OF MANOR HOUSE, WOODHORN MORPETH.

The Duke of Tyne (17751), a roan bull, bred by Mr. M. Spraggon, of Nafferton, Northumberland, and calved on November 10th, 1858, is by Richard Cœur-de-Lion (13590) out of Welcome, by George (12938); her dam Duce, by Duke of Albany (10149), — Duchess, by Duke of Cornwall (5947); — Datura, by Mowbray (4516); — Tuberose, by Caliph (1774); — Daffodil, by Rufus (2576); — by Daniel (952); — by Young Lancaster (1162); — by Merlin (429); — by Alfred (23); — by Windsor (698); — by Cupid (177); — by Suwarrow (636).

This pedigree, it will be seen, has a nice combination of the Booth and Bates blood, the sire of the Duke of Tyne being bred by Colonel Towneley, and his dam's sire by Mr. Booth.

At Mr. Spraggon's sale in March 1859, the Duke of Tyne, then a calf four months old, was purchased by Mr. Wilson, who picked him out from a dozen or more of others, as a smart blood-like young one, though, if anything, with rather a want of substance. During the summer of the same year the Duke commenced his public life at the Northumberland Agricultural Society's open Show at Morpeth, where he finished second to a bull the property of Mr. Wells, of Redleaf, Kent; the winner being within two or three days of a yearling, and the next best but eight months old. In this season the Duke of Tyne was also sent to the Durham County Open Meeting at Hartlepool, where he was pronounced to be the best of his class.

In 1860, the Duke of Tyne was kept down in a poor and ordinary working condition, in which state he was exhibited in the Two-year-old class at the Northumberland Society's meeting at Alnwick, and being taken ill on the show ground was consequently passed over unnoticed.

In 1861, the Duke of Tyne was never exhibited, being kept exclusively for use.

In 1862, the Duke of Tyne only appeared twice in public, winning the first prize in the Aged Bull Class at the Belford Meeting of the Northumber-

land Society, against a very large entry, including bulls that had been commended at the Battersea Show of the Royal Society in the month previous. At the Durham County Meeting at Sedgfield he took the second prize, being beaten for first by Mr. Ambler's Gamester.

In 1863, the Duke of Tyne's first appearance was the Worcester Meeting of the Royal Agricultural Society, when he won the great prize of £25 as the best Shorthorn bull in the All-aged Class, beating Mr. Charlesworth's General Murat second, Mr. J. Brawn's Young Radford third, Lord Feversham's Vice-Chancellor highly commended, Mr. Bickford's Duke of Manchester commended, the Earl of Zetland's Savile commended, and many others. At the Durham County Show at Gateshead, the Duke took another first, with General Murat again second to him. At the Kelso Meeting, however, of the Highland and Agricultural Society of Scotland he sunk down to the Bronze Medal, or third place, with Mr. Stirling, of Keir, first for Forth, and Mr. Binning Home second with Van Tromp. Forth, it will be remembered, was the first of his class at Battersea, and in the opinion of many far away the medal bull of the show. The Duke of Tyne, however, seemed sadly *trashed* and weary at Kelso, as might be easily imagined, from his having been for three weeks out of his own yard, during which time he had travelled upwards of 600 miles, so that his hair had come off considerably from railway travelling and such like wear and tear. In September, the Duke was brought out for the last time during the season for Mr. Clarke Irving's 50-guinea prize, and when with twenty-three before them the judges settled to a couple—Royal Butterfly ultimately standing first and the Duke of Tyne second.

SUMMARY OF THE DUKE OF TYNE'S PERFORMANCES:

In 1859, he was exhibited twice, won once, and was second once.

In 1860, he was exhibited once, but unnoticed.

In 1861, never exhibited.

In 1862, he was exhibited twice; won once; and was second once.

In 1863, he was exhibited four times; won twice; was second once, and third once.

Has been exhibited nine times, was first four times, second three times, and third once.

It will be seen from this that the Duke of Tyne has always proved himself a good bull, while our opinion of his class will be, perhaps, best gathered from what we said when we saw him at Worcester:

"With nearly double the number of entries, as compared with the Herefords, and reaching in all to somewhere about a hundred and eighty head of cattle, the Shorthorns were by no means so even a sample of their sort. On the contrary, they were a very ragged lot, with a number of drafts in almost every class, and scarcely one really grand animal amongst them. It was not, in fact, until we had travelled on to Mr. Eastwood's white yearling bull, The Hero, and had coupled him with our own old acquaintance of many a meeting, Lady Pigot's Pride of Southwicke, that we came to anything like really 'Royal Firsts.' Still the best old bull, Mr. Wilson's Duke of Tyne, is a well-known winner in the north—at Hartlepool as a calf, at the Durham County, and at Belford; while he is by Richard Cœur de Lion, a bull from Col. Towneley's herd. Then, Mr. Wilson himself was not only one of the judges of steam-ploughing at Worcester, but the acting secretary to the local committee that a month or two back secured a second visit from the Society

for Newcastle-upon-Tyne; so that even beyond his personal appearance the prize bull has many contingencies in his history. There is no question, either, despite one of the judges declaring against him, that he was the best of his class on Monday; and when seen out is a very telling animal. With great size, a deal of character, and of good quality, he is wonderfully fine forward, and would be a very imposing animal to meet, but for his long, plain effeminate head, which must always be a strong point against him. General Murat was also second at the York show last year, where we spoke of him as showing more use than style, a point in which he is still terribly deficient. In fact, instead of preferring him to the Duke of Tyne, the general opinion was that Mr. Brawn's lengthy and handsome Young Radford should have had second place. Amongst the commended Mr. Clayden received no notice for his elder Marquis of Cornwallis, while Lord Feversham's blood-looking bull showed a deal of his sire's high quality and temper."

We may, however, in justice add that the Duke of Tyne is quite as valuable in the herd as on the show-ground, being, in fact, a wonderful stock-getter, with his progeny, including twins, and even triplets. He was the first animal his owner, Mr. Wilson, ever exhibited at a meeting of the Royal, being indeed, a very young man, whose education the Cirencester College had the credit of completing.

Mr. Wilson has just sold the Duke of Tyne to Mr. Ainslie, of Costerton, near Dalkaith.

PLATE VI.

TIM WHIFFLER; WINNER OF THE CHESTER, GOODWOOD, AND DONCASTER CUPS, 1862.

Tim Whiffler, bred by Mr. Fobert, the well-known trainer, at Middleham in 1859, is by Van Galen, out of Sibyl by The Ugly Buck, her dam Sylph, by Filho-da-Putá—Twatty, by Whalebone.

Van Galen, bred by Mr. F. Walker in 1853, is by Van Tromp, out of Little Casino, by Inheritor. As a race-horse, Van Galen ran respectably as a two-year-old, but broke down early in the following season, and went at once to the stud. He covered for a couple of seasons at Middleham, and subsequently in the same neighbourhood, but has hitherto had very few thorough-bred mares; and Tim Whiffler is not merely the only winner, but the only runner out by him. Such proof, however, has been considered quite sufficient, and Van Galen stood last season at the Fairfield Farm, York, with a subscription of forty mares, at 20 guineas each. The horse's present owner, Mr. Metcalfe, has refused a long price for him since Tim Whiffler's appearance.

Sibyl, the dam of Tim Whiffler, was bred by Mr. J. C. Knox, in Ireland, in 1851. She never ran, but went to the stud at two years old, where she is the dam of Staff-carrier, Meadowdale, and Miss Stewart, all by Oxford Blue; and since, as the property of Mr. Fobert, of Oldminster, by Newminster, Tim Whiffler, Manfred, by De Clare, and

a now two-year-old filly by The Cure. Sibyl died in the autumn of 1861, when in foal to Lambton.

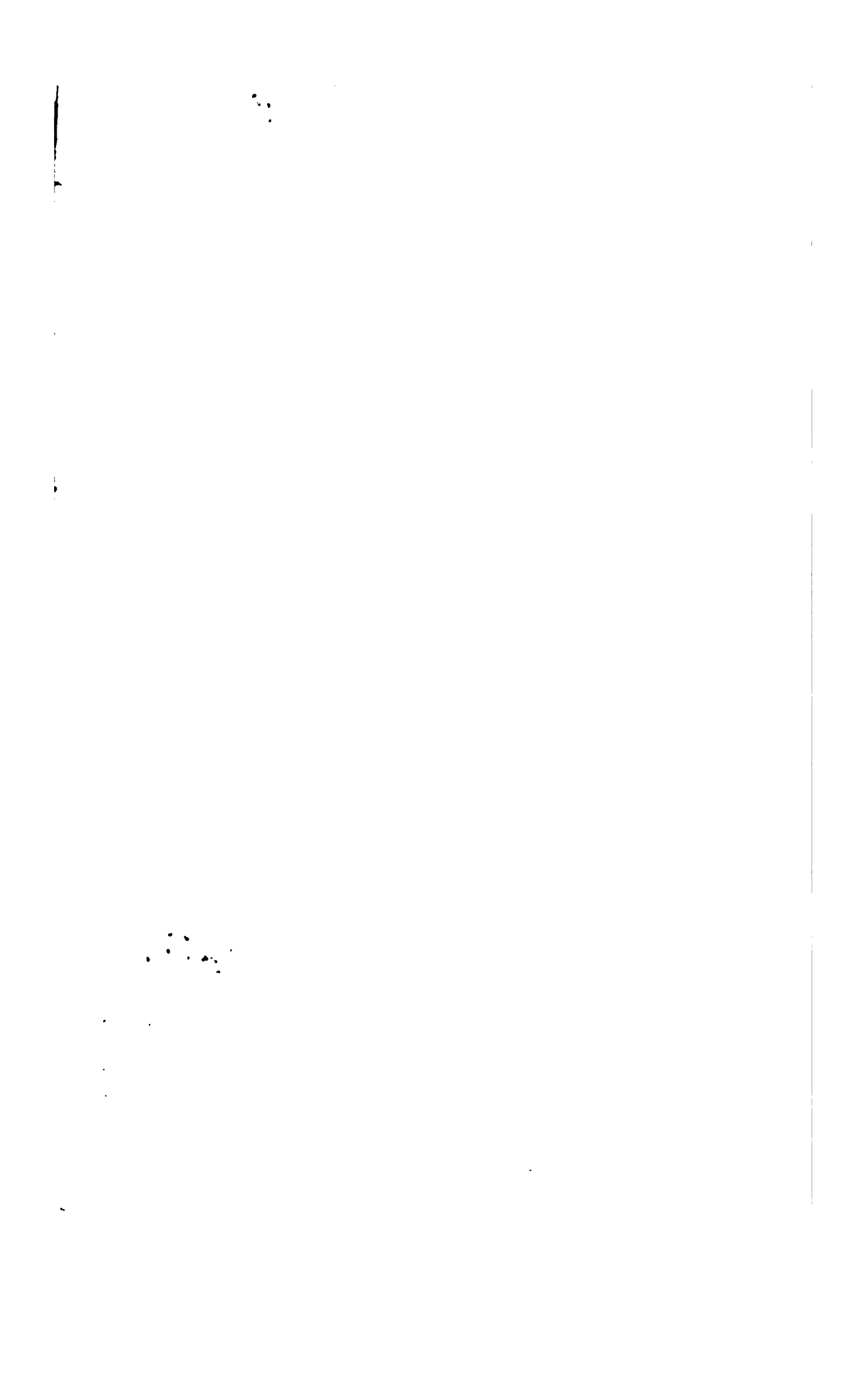
Tim Whiffler is a brown horse, standing barely fifteen hands three inches high. He has a small wicked-looking head, with a fine light neck, and clean, but rather upright shoulders. He has a light barrel, but good back, with blood-like quarters, and capital thighs. He is not over big in the arm, and stands high from the knee and hock to the ground. He is a little over at knee, and upright in his joints, while he is a narrow nag to follow, and altogether a small, wiry, light-fleshed horse, with but little in his appearance to warrant his performances. In fact, Tim Whiffler will go down to posterity in company with The Hero, Fisherman, and some other great Cup winners, whose make and shape for going under weight and over a distance set all the recognized rules at defiance. Tim Whiffler has, however, the recommendation of a sweet temper, backed by fine action. He is, indeed, a perfect snaffle-bridle horse, and with a certain game varmint look about him, carries something very attractive in his style when once set going.

Tim Whiffler was purchased by Lord William Pawlett at Ascot, in 1862, for 2,500 guineas, and a contingency if he won the Goodwood Cup, which he succeeded in doing.



Engraved by G. H. B.

Tom Whiffles
Winner of the Chester, Epsom, and Doncaster Cups 1862



THE GROWTH OF CORN.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

We are ever and anon reminded of the yet deficient state of our agricultural knowledge. Certain hints which dame Nature vouchsafes—novel experiments instituted by fresh minds, seem to now and then cheer us on to renewed efforts after knowledge in our very difficult science of agriculture. In this paper I am anxious to draw the reader's attention to one or two such lately-noticed facts by men of practical and scientific knowledge, one of these being an English, and the other a French searcher after truth. The practical inquiries which these gentlemen have instituted possess the great merit of being inexpensive and easily repeated—the one merely needing the use of a thermometer, and the other that of a rope—and I am the more desirous that my readers should carefully repeat and verify these important observations on the growth of corn, since I am well assured that the stock of knowledge thus acquired will lead, in most cases, to profitable results.

In commencing these researches, let the agriculturist remember that it is no reason why we should not ask questions of Nature, that we do not exactly see the *reason* of the inquiry. If we were thus to be deterred, our knowledge of the endless mysteries of vegetable and animal life would indeed be limited, and yet we are continually meeting (and it was so in all ages) with traces of this injurious feeling. Every important attempt, indeed, to improve the productiveness of the soil has unfortunately been ever certain to meet with a respectable opposition from those who fancied that farming had already attained every possible degree of perfection. It was the fate experienced by Jethro Tull with his tillage system; by Bakewell, with his Dishley sheep; by the Culleys and the Collings, with their shorthorn cattle; by the first Earl of Bedford, in his gigantic and finally successful attempts to drain the now prolific Bedford Level; and by all other improvers of the agriculture of their country. And only remember with what a wretched kind of cultivation our countrymen were once content; for instance, the Suffolk farmers of the days of Tusser rarely or never attempted the growth of wheat. He tells us (writing about the middle of the sixteenth century) that it was then only produced by good husbandry. He says:—

In Suffolk again, whereas wheat never grew,
Good husbandry used, good wheat land I knew;”

and on those lands where they did succeed in growing wheat, they were content with a produce which a modern Suffolk farmer would consign unthrashed to the straw-yard. Thus we find (and it is rarely we can get any accurate detail of their produce) an account of a year's crop of wheat, given by Sir John Cullum, in his “History of Hawkstead,” from which we learn that in the year 1387 the produce of 66 acres of wheat on the manor farm of that Suffolk parish (a farm consisting of 872 acres, of

which 321 were arable, 30 meadow, and the rest pasture and wood) was only *one quarter per acre*. And again we find, from a law tract called “*Flota*,” written about the commencement of the fourteenth century, that no farmer was then *content* unless he obtained a return of at least *three times the amount of the seed wheat*; which, supposing they employed, as stated in another place, *two bushels per acre*, would only be equal to a crop of six bushels per acre. It is supposed, in fact, that in those days the wheat crop averaged twelve bushels per acre. Miserable as were these crops, few persons regarded them as capable of much improvement. The Parliament of those days evidently enjoyed the same contented ignorance of the capability of our soil. Thus, to give one instance amongst many, the legislature of the reign of Henry VII. prohibited the enclosure of waste grounds, as being highly prejudicial to the breeding of sheep—just in the same wise spirit as that which formerly prompted all the small tenantry of Lincolnshire most determinedly to oppose the drainage of the Bedford Level, on the plea that the growth of rushes would be prevented, and the breed of wild-fowl, fish, and geese be injured by the removal of that great mass of stagnant waters! and this kind of reasoning even now induces the freemen of several English cities and towns to preserve their commons sacred to half-starved cows and other miserable animals.

Every cultivator will remember the occasional occurrence of very large crops of wheat—of a produce, in fact, so large that every one who heard of them seemed inclined to suspect the existence of some error in the report—these large yields, too, being in some cases very unexpected, the appearance of the growing crop not leading any one to anticipate a remarkable produce. It is, however, known to every one how very imperfectly the ears of the wheat plant are wont to be filled, and how much this varies in different seasons. We all are aware how great a difference this makes at harvest time in the produce of the seed. Certain states of the weather—particular warm gentle breezes, when the wheat plant is in bloom—are regarded as peculiarly favourable for the fertilisation of the plant. Now, a French farmer has attempted, and seemingly with great success, to produce this result at pleasure by a very simple artificial contrivance. And the success of his plan has been such as to attract the attention of the French Government, and led to a recent visit by the Emperor to the estate held by M. Hooibrenck, near Eprenay; and since then three commissioners—M. M. Payen, Dailly, and Simon—have been appointed to enquire and report upon M. Hooibrenck's mode of cultivation. In the absence of that report I take the brief account of his process from a late number of the *Gardener's Chronicle*:—

The method is very simple, being merely a rope, twenty or thirty yards long, covered with a fringe of wool of twenty-five or thirty centimetres deep, resembling a long woollen comb, which is drawn across the field two or three times whilst the corn is in flower. The pollen sticks to the woollen threads, and is then deposited upon the female organs of the ear; fertilization thus takes place, we are told, with a regularity and completeness, which the finest season cannot ensure. This experiment, it seems, has been repeated at M. Jacqueson's, of Sillery, upon 200 acres of wheat, rye, barley, and oats, and that from equal areas of the different corn crops experimented upon the following important results have been obtained:

RYE.			
	Litres.		Weighing
Not fertilized	22	.....	16 kilos.
Fertilized	34	.....	25
WHEAT.			
Not fertilized	30	.....	21
Fertilized	41	.....	31
BARLEY.			
Not fertilized	28	.....	16
Fertilized	40	.....	24
OATS.			
Not fertilized	30	.....	12
Fertilized	42	.....	17

Surely these results are highly worthy of further inquiry, and the repetition of the experiment. It seems that M. Hooibrenck considers that this year's harvest being abundant is rather against the comparative results obtained by his process of fertilization, the advantage of it being much more evident in a worse season. These researches have been directed to the increased produce of seed from a given number of the ears of different cereals: the observations of Mr. J. B. Spearing, of Moulaford, have been with the object of increasing the number of the ears of corn in our fields, and from remarks which he addressed during the present season to the members of the Central Farmers' Club it is evident that these are also very important facts for the holders of our arable soils to consider and verify. It was when giving his "practical remarks on the effects of temperature on the cultivation, from observations made during the three past seasons, that Mr. Spearing had occasion to tell the great farmers then assembled, "There seems great diversity of opinion as to the best or proper season of planting; many contend that on poor land it is desirable to begin sowing by new Michaelmas Day; others as early in October as possible, while only a few think November soon enough. The result of my observations is, that it is not a question of time. I do not think it is safe to plant wheat in the autumn until the temperature of the earth is reduced to 50 deg., which is seldom, if ever, the case until the last week in October on warm soils, and the middle of October on cold and more backward ones. In 1860 mine was reduced to 50 deg. on the 30th of October; in 1861, on the 31st October; and in 1862, on the 1st of November. If wheat is sown before the temperature is sufficiently reduced, it does not remain long enough in the ground to take good root, and I have seldom seen a good crop of wheat grown from seed that came up in less than thirty days. In 1860, wheat drilled on the 26th of October came up on the 28th of November, lying 32 days in the ground, and took 1,426 degrees of heat, at a daily average of 44 deg. In 1862, that which was drilled on the 30th of October came up on the 1st of December, lying 31 days in the ground, and took 1,379 degrees of heat, at a daily

average of 44½ deg. Another disadvantage arises from sowing when the temperature is too high: weeds vegetate which could not at a later period, and if not impossible are certainly very difficult to eradicate. The first thing the young wheat plant has to contend with is the winter season. Under most circumstances I think we may safely say that from its hardness the severity of the winter season is of but little consequence provided the seed was sown sufficiently late so as not to become too gay or winter proud. The plant commences its growth in the spring, as soon as the temperature of the soil reaches 43 deg. or 44 deg. In 1860 I first perceived the wheat begin to grow on the 28th of March, when the temperature of the soil was 44 deg. It was 145 days to the 20th of August before it was ripe, from which we must deduct 12 days, when the temperature was below 42 deg. (when wheat cannot grow or progress); this leaves 133 days for it to mature in. In 1861, I noticed the wheat begin to grow on the 24th of March, when the temperature was 43 deg., and it was 130 days to the 2nd of August before it was ripe. The temperature was not once below 42 deg.; so that there was no deduction to be made from the 130 days. In 1862 the temperature of the soil reached 43 deg. on the 11th, 12th, and 13th of January. It then receded for 17 days, after which it gradually increased for five days, reaching 46 deg. on the 4th of February. It ranged from 39 deg. to 46 deg. again up to the 11th of March; so that the wheat was constantly growing above ground the whole of the spring, consequently it did not take good or deep root in the soil, and was not likely to produce a heavy or even an average crop. The weather in March is of the utmost, or I may say vital, importance to the wheat plant. As the land becomes dry in March, the roots keep penetrating deeper and deeper into the soil to obtain moisture, and by so doing ample provision is made for the plant to extract that nourishment and support which is necessary for its future well-being and development; but, on the contrary, if we have much wet in March, accompanied, as it generally is, by a high temperature, then the plants grow above ground, and the roots being supplied with moisture on the surface, are not induced to penetrate sufficiently into the soil so as to be able at the required time to draw that amount of nourishment from the land which alone can enable it to produce a heavy crop. Nor would it be able to do so if the summer afterwards should prove to be more than usually dry and propitious. The amount of rainfall for March, 1861, was 2.06 inches; for March, 1862, was 4.29 inches; and for March, 1863, only 0.63 inches. The next critical period through which wheat has to pass is from the time of its coming into ear to the time when the blossom is fully set. At this time the temperature of the air is of more importance than at any other stage of its growth. Extreme heat is not desirable, but a medium temperature, with the least possible daily range; for I have never observed red gum, rust, or mildew to any extent unless there had been a difference of from 32 deg. to 35 deg. between the mean maximum or heat of the day and the mean minimum or cold at night; and it prevails to a greater or less degree just in proportion as the range of temperature increases or diminishes. I have known wheat to vary from 49 to 70 days from the time of its coming into ear to the time it was ready for the sickle, according to the amount of heat, as it requires from 3,000 to 3,500 deg. to mature it. In 1860, the wheat which came into ear on the 12th of June took 69 days to ripen, and 4,191 deg. of heat; from which we must deduct 562 deg., for 10 days, when the temperature was below 58 deg.: this leaves 3,629 deg. for the 59 days, at an average of 61½ deg. The greatest heat the soil reached this season was 64 deg. on the 14th and 15th of July, after which the earth gradually lost its

heat. In 1861, wheat which came into ear on the 5th of June took 55 days to ripen, and 3,506 deg. of heat; from which deduct 281 deg. for five days, when the temperature was below 58 deg. This leaves 3,225 deg. for 50 days, at an average of 64½ deg. The greatest heat the soil reached this year was 67 deg. on the 20th June, and on the 13th and 14th of August. In 1862, wheat which came into ear on the 9th of June took 3,406 deg. of heat, and 56 days at an average of 61 deg. The highest temperature of the soil was 64 deg. on the 30th of July, where it remained for seven days. It only reached 64 deg. once more this year, viz., on 29th of August."

Then again, the improvement of our seed corn is another very important, although difficult question. This valuable inquiry, upon which Mr. F. Hallett, of Brighton, is now employed, appears likely to be productive of very beneficial results, especially if the institutors of such experiments will attend carefully to Nature's suggestions, adhere strictly to her hints, and not endeavour to theorize when they should be gathering facts. It was with much pleasure, in the middle of last month (November), that in paying a visit to Mr. Hallett's Manor Farm, I felt that these were the principles upon which its owner was proceeding. The chief objects for which he is labouring were mentioned by him some time since, when describing the mode of culture he adopts in preparing his very remarkable "pedigree" wheat (*Jour. R. A. S.*, vol. xii., p. 371). He tells us that his object is to show that the wheat plant requires a mode of culture which permits its perfect growth, and that when it is so cultivated by the repeated selection of the seed, of which the record, as in breeding animals, is a pedigree, we can gradually increase the contents of the ears without in the slightest degree diminishing their number. The plan of selection he thus describes is as follows:—"A grain produces a 'stool,' consisting of many ears. I plant the grains from these ears in such a manner that each ear occupies a row by itself, each of its grains occupying a hole in this row; the holes being 12 inches apart every way. At harvest, after the most careful study and comparison of the stools from all these grains, I select the finest one, which I accept as a proof that its parent grain was the best of all, under the peculiar circumstances of that season. This process is repeated annually, starting every year with the *proved* best grain, although the verification of this superiority is not obtained until the following harvest. During these investigations no single circumstance has struck me as more forcibly illustrating the necessity for repeated selection than the fact, that of the grains in the same ear *one is found greatly to excel all the others in vital power.*"

The choice of the variety and change of seed is an equally important branch of these valuable inquiries. Upon this Mr. Pawlett, of Beeston, has been long employed; he has given the results of some of his trials on seed wheat during the season of 1863, in a recent number of *Bell's Messenger*. The produce in bushels and pecks per acre of six varieties, grown under precisely the same circumstances, was as follows:—

	Bush.	Pecks.
Burmah white wheat ...	38	0
Corner's white ...	43	1
Grace's white ...	47	0
Ditto second experiment ...	52	2
Borwick red ...	52	0
Golden-drop red ...	50	2
Tibbald's "wonder" red ...	53	0

If we examine the produce of different varieties of oats, the same disparity in the produce is found; take, for instance, the experiments lately recorded by Mr. W. Walker, of Ardurchart, in Aberdeenshire: these I extract from his prize essay (*Trans. High Soc.*, 1863, p. 477). The results obtained in 1861 were as follows:—

Plots.	Quantity of dressed grain per acre.	Market value of dressed grain per acre.
	Qrs. bush. lbs.	£ s. d.
Plot No. 1. Kildrummy oats	5 5 21	5 18 1½
Plot No. 2. Potato oats	5 4 4	5 18 5
Plot No. 3. Scotch Birle oats	4 7 81	5 9 2
Plot No. 4. English Birle oats ...	5 6 25	6 8 0

In 1862, these experiments being repeated, the following results were obtained:—

Plots.	Quantity of dressed grain per acre.	Market value of dressed grain per acre.
	Qrs. bush. lbs.	£ s. d.
Plot No. 1. English Birle oats ...	4 5 12	5 9 7½
Plot No. 2. Scotch Birle oats	5 0 7	5 12 11
Plot No. 3. Potato oats	5 1 0	5 10 2½
Plot No. 4. Kildrummy oats	5 3 28	5 17 5½

Such are a few of the yet-far-from-being exhausted practical inquiries, which shadow forth profitable results to the great agriculturists of our country. They are of a class which I ever feel pleasure in tracing, since they are not likely to lead to any but useful knowledge. It is idle, indeed, to conclude that our corn has attained its maximum produce—that we, in the year of grace 1863, have reached perfection in our cereals. If we were to fall into that error, we should merely reason as the Surrey farmers did in the reign of Henry the Fifth. They then thought that the land could do no more than yield about three sacks of wheat per acre. They, too, derided those who ventured out of the beaten track. That, mark you, was the time when we find that the tithes (then taken in kind) of the parish of Beddington, close by where I am now writing, produced only £21 2s. 8d.* a year—tithes now commuted at £1215.

	£	s.	d.
* Sum total of receipts	21	2	8
Deductions, including £5 to the Abbot of Bermondsey	11	15	4½
Balance to the rector of Beddington ..	£9	6	10½

ON THE WINTER FATTENING OF CATTLE.

Although the importations of cattle into the kingdom have been unprecedented during the past few years, still it does not suffice to lower the price to any great extent, or fix it below a remunerating price to the British breeder and feeder. There has been, undoubtedly, a very great and increasing demand for flesh meat; but that does not form the sole cause of the present high rate of prices. That is owing to more remote causes. One is, that the extent and improvements in breeding, great as they are, do not keep pace with the increase and wants of the population. Another and more certain cause is the long continuance of those direful epidemics, pleuro-pneumonia and the foot-and-mouth diseases. These causes have produced a scarcity. The losses from these diseases have been surprisingly great, and it may be said to be truly national. It will take some years further to restore stock-breeding to the old order of things. Independently of the actual loss of life and failing health and condition, much inconvenience and loss of time occurred in breeding animals, and many would not breed at all; so that, taking this view of the subject, no one need to wonder at the high price of meat; and although high and remunerative now, yet the breeders have many "old sores" to heal, and many an empty purse to replenish, which we fear cannot be accomplished until these diseases are thoroughly eradicated from our herds.

The best, the quickest, and the most economical method of fattening cattle is a question which is under discussion amongst the farming community every day; and well it is so, as upon its being thoroughly known and practically carried out does any profit arise from fattening cattle in the winter season. Summer grazing is altogether a different order of business, dependent mainly upon the state and richness of the pasture; but in winter fattening, all the food has to be administered to the animals, and therefore nearly all depends upon their being supplied with proper food, and under every advantageous circumstance of comfort and good management. It is not that they have the best and most nutritious food alone. They must have regular attendance, warm, commodious shelters or hovels, dry lairage, and undisturbed rest. Without these accompaniments, great loss of food will ensue, and the animals will thrive but slowly, if at all.

Much has been said relative to the best and quickest method of fattening, and the best food to be given. Modern practice has brought into justifiable requisition many new varieties of cattle-food, and many preparations of the old kinds. The farmer's chief resort, in fattening his cattle, has hitherto been to his stocks of swedes, mangolds, turnips, rape, cabbage, carrots, potatoes, parsnips, and hay, corn, straw, &c., &c.; but modern improvements have brought out not only linseed cake, but almost an innumerable variety of food and condiments, amongst which, in cakes, we have rape cake, cotton cake, nut cake, poppy-seed cake, mustard-seed cake. Then we have various meals—wheat-meal, oatmeal, bean-meal, pea-meal, barley-meal, linseed-meal, Indian-corn-meal, rye-meal. Again, we have various vegetables, and minor pulse kinds of food, such as the locust bean, the harvest bean, lentils, pomegranates, &c., &c. Then, as condiments, we have ginger, coriander seed, gentian, cummin seed, carraway seed, fenugreek seed, salt, soda, sugar, starch, gluten, &c., &c.; and lastly, we have a class of condiments or food manufactured by interested parties from some of the above-named ingredients, and sold at

enormous prices and profits. These heterogeneous compounds may be useful—nay, they may be very valuable as condiments, in promoting health and condition; but in most cases it is buying food at 100 per cent. beyond its real value. Cattle-feeders will ere long make themselves acquainted with the uses of these condiments in their fattening economy, and will adopt them more generally, if not universally. This is one important part of the subject of cattle-feeding, and is but little understood. Agricultural chemistry throws some light upon it, which is worth every attention; but cattle-feeders, as a class, give little or no heed to such fanciful theories, and would reject such auxiliaries to rapid fattening, if attended with unusual care and trouble.

Another part of the subject of quick cattle feeding is, the necessity of studying the habits and requirements of fattening cattle. Cattle, when not under restraint, take considerable exercise; hence it would appear that loose boxes are preferable to confinement by the neck in stalls. Cattle, when depasturing in fields, eat frequently, and take rest sparingly, and at comparatively short intervals, except at night; hence it would also appear that more frequent feedings would be desirable. Ease, warmth, comfort, quietude, are indispensable to a fattening animal: hence secluded yards, hovels, boxes, covered sheds, or dark loose boxes are to be preferred, and separation from store stock is necessary. It is also highly desirable that no disturbance or distraction from the various farm operations proceeding upon the premises should occur, or, at most, that all should proceed as noiselessly as possible. The very attendant or herdsman should be kindly disposed and familiar with the animals. It is remarkable how sensitive domestic animals are to human kindness; none more so than early fattening cattle. They watch every movement of their attendant, and listen to every sound as feeding time approaches, and when loose follow him everywhere. They almost invite his caresses, and are delighted to be brushed or wiped over daily. This is almost essential to rapid progress. It promotes a healthy and clean skin, and freedom from scurf or hitching. As rest and repose is so requisite, a constant attention to the beverage is necessary, and at every feeding the litter should be shaken up, to tempt the animals to lie down. The attendance should be regular, prompt, and quick, so that they may be speedily left to their undisturbed repose.

Very much might be said upon the food to be supplied, and its administration; but as this must depend so much upon the actual produce of the farm and the farmer's means, a few general suggestions must suffice. The fattening cattle should be brought into their winter quarters prior to the commencement of cold and stormy weather. The change from grass pasture to winter food should be as gradual, and the food as similar to grass, as possible; hence common or white-fleshed turnips should be first given in moderate quantity. The following suggestions may not be out of place here. An ox of sixty stones should have two bushels of turnips, sliced—not sliced turnips—five pounds of good linseed-cake, five pounds of meal, and cut grass, hay, or clover hay, *ad libitum*, with a very scanty allowance of water. The times of feeding should in some measure be regulated by the moonlight—Nonsense! what next? Nevertheless, it should be so. All animals when at large, or unrestrainedly feeding, will invariably feed by moonlight, but not in the dark: hence it

is desirable that on moonlight nights a light feeding or ration should be given rather late at night, or between eight and nine o'clock, and on moonlight mornings an early feed, about five or six o'clock, is beneficial. In this way the feeds should average four daily, and at equal intervals if possible. The morning feed, as being the longest interval in rest, should consist of a bushel of turnips, two-and-a-half pounds of meal, and hay chaff; the next feed should be half a bushel of turnips, two-and-a-half pounds of cake, and hay chaff; the third should be half a bushel of turnips, two-and-a-half pounds of meal, and hay chaff; the last should be two-and-a-half pounds of cake, and hay chaff. Some deviation is often desirable, and indeed necessary, which the farmer's judgment can best decide. Should symptoms of looseness of body appear, resort must be had to the stomachics, *i. e.*, coriander or caraway seeds, or ginger, or gentian, &c. Should costiveness intervene, then salt, soda, &c., must be

given. Should their progress be slow, then try a mixture of locust-bean-meal, caraway, or fenugreek seed, linseed-meal, and either wheat, bean, pea, barley, or oat-meal, with a slight and proportional increase of food; the seeds mainly to give flavour. The mixture to be made in accordance with good judgment, and to be given as a condiment, *i. e.*, in small feeds, and only once daily. Of course swedes should soon supplant the common turnip, as being more nutritious; mangolds to follow in the spring. It often happens that the animals appear cloyed with one kind of food. Well, then withdraw it for a time, and substitute another. Almost any nutritive farm produce will make a favourable change. Oat-chaff instead of hay, bran instead of meal, corn instead of cake, cabbage instead of turnips, mangolds instead of swedes, wheat-chaff, pea haulm, or even less valuable food, will be acceptable as a change, and which every farmer can best devise, but only for a time.

THE USE OF WHEAT AS FOOD FOR STOCK.

The abundance of the late wheat crop, and the low price of that grain relatively with other cereals, have induced many farmers, in different parts of the country to lessen the quantity on hand by feeding their cattle, and even their horses, with wheaten meal; considering it the cheapest and best kind of food they can employ for the purpose, as well as thereby enhancing the market price. I believe that with the present commercial arrangements the latter idea is fallacious; for as our neighbours of the Continent have quite as large a surplus as ourselves, and are quite ready and willing to supply us with what we may require, *and more*, I apprehend that whatever inroad may be made upon the stocks on hand will be more than compensated for by importations, and therefore it will be in vain to look for an advance in price from the extra consumption by cattle. We had a sufficient illustration of the correctness of this assumption in the history of the wheat trade of last year, when with a deficiency of one-third, which formerly would have driven the price up to the famine point, the want of eleven million quarters was more than supplied, and the price was never higher than would rule with an ordinary crop. And this must in future necessarily be the case, unless under so general a failure of crops that other countries will not be able to supply us, which is a contingency not likely to happen. My object in writing this paper is to show the present comparative value of the different kinds of cereals, in order that the reader may judge which is really the best and cheapest to use in the feeding of cattle.

On a reference to the returns of last week, inserted in this journal of the 26th, I find the highest price of the *best* red wheat was 48s. per quarter; the *best* malting barley, 38s.; the *best* potato oats, 25s.; and the *best* red Indian corn, 29s. I estimate the respective weights of these at—wheat, 66lbs.; barley, 56lbs.; oats, 44lbs.; and Indian corn, 60lbs. per imp. bush. Taking wheat, therefore, as the standard of comparison (the price being 48s. per quarter, and the weight 66lbs. per bushel), we must find what will be the value per quarter of the other cereals, supposing they weighed 66lbs. per bushel? Thus, if barley weighing 56lbs. per bushel is worth 38s. per quarter, what would it be worth if it weighed 66lbs.?

56lbs.=38s. ... 66lbs.=44s. 9d.

OATS

44lbs.=25s. ... 66lbs.=37s. 5d.

INDIAN CORN

60lbs.=29s. ... 66lbs.=31s. 10d.

It would therefore appear that barley, as food for cattle, is quite out of the question this season, being absolutely *dearer*, taking weight for weight, than wheat. Oats also are within 6s. 7d. in price of the value of the *best* red wheat; and if we reckon the greater quantity and weight of husk, I should find that the flour or meal remaining would be quite as high in price as wheat-meal. On the other hand, Indian corn, which is excellent food for cattle, and would fatten them faster than wheat, is 11s. 2d. lower than that grain; it will therefore be more profitable to the grower to sell his wheat at 48s., and purchase Indian corn at the present market price, than to grind his wheat and give it to his bullocks. On the other hand, if he has capital, I believe it would be better for him to hold his wheat over the present season, for it is seldom that two years of abundance come together; and, at any rate, it is not possible that prices will be lower, and therefore no harm would be done by holding over.

I confess I do not like the idea of giving to cattle what is intended for the exclusive use of man, and which for him is emphatically the "staff of life." Nor do I think such a course is right, when Providence has blessed us with such abundance, and that these endeavours should be made to deprive the labouring classes of the benefits of that abundance, by raising the price by factitious means. Their case is hard enough, at best; for the wages are reduced in proportion to the price of wheat, and when thus modified, a temporary rise in price will not generally be met with a corresponding advance in wages.

The high price of barley, with so large a crop as has been reaped this year, is a good omen for the agriculturists. It is evident from this, that the consumption of malt liquors, whether at home or abroad in the British colonies, is increasing, and that in future the growth of barley may be considered as certainly remunerative. The usual proportion between the price of barley and wheat used to be, three of barley to two of wheat. Thus, if the latter was at 42s., the former would be 28s. per qr. For some time these proportions have ceased; and this season, with probably an *equally good* crop of each, we find barley maintaining, by the qr., nine-tenths of the price of wheat, and, taking weight for weight, even exceeding it in price. The fact is, that, while the consumption of barley largely increases, the supply of that grain cannot

be much increased by importations, at least of a malting quality, which is therefore likely to rule high in future, as well as in the present season.

This is peculiarly a consideration with the light-land farmers, their soil being specially adapted to the cultivation of barley—the question whether it would not be advantageous to them in future, in some cases, to substitute barley for wheat, where the style of farming and the quality of land are such as to ensure the best kinds of malting barley. The larger produce and the higher relative price the last few seasons seem to point to this conclusion. I look upon the case to be similar to that of wool. With the increasing demand for wool of all kinds and qualities,

it was found, that while fine wool could be produced in any quantity, the produce of coarse English wool did not keep pace with the demand, because the consumption of fine-woolled mutton called for an increase in that direction; and the consequence was, the price of long wool rose to nearly the same rate as that of fine wool. In the same way, although we can import a considerable quantity of their grinding barley, the proportion of malting foreign barley is so small as not to make any impression on the price. This is an important question for the agriculturists at the present time, when it is a difficult matter to know on which side to look for a profit from the land.

AN OLD NORFOLK FARMER.

THE NEW ROYAL RULES FOR SHOWING SHEEP.

It is but an ungrateful office to be continually protesting against an abuse, the correction of which is carefully avoided. Still, however ungracious may be such a duty, it is nevertheless the more necessary the longer the evil is suffered to exist; and for years past, from meeting after meeting, have we been harping on the same string, and condemning the absurdly unfair manner in which show sheep have been got up. But any remedy was impossible. Old members of Council shook their heads, and older Stewards of Stock could not countenance any reform. Exhibitors would never submit to have their rams and ewes seen in anything like the shape that Nature made them; and hence one section at least of our great national gathering stood openly confessed to be little better than a mockery and a snare. Still, the man who wished to go straight received assistance at last from a quarter in which he had been brought to expect little or nothing. By some extraordinary oversight a new Steward of Stock was appointed for Worcester, a gentleman who had never served the office before, and who, moreover, had not been sufficiently long on the Council to become thoroughly imbued with all the pet prejudices and impediments of his fellows. Even further, as we said when the new number of the Journal appeared, it turned out that, beyond the remarks of the two Veterinary Inspectors, the only part of the Stock Stewards' report really worth reading was that contributed by the new man, and to which he did not hesitate to put his name. Mr. Dent's young experience in his own especial department went dead against the course of action, or rather of inaction, hitherto deemed so politic, and he boldly challenged the question in these memorable words: "The more I saw of the show the more I felt that the Society should try to grapple with the shearing question." At the Monthly Council Meeting, held in the first week in August, the Report of the Stewards of Stock at Worcester was read, and Mr. Dent's suggestion at once adopted. A Committee was appointed "to frame regulations relative to the clipping and preparing sheep for show;" and on Wednesday last the Report of this Committee was received and adopted. The recommendations go to this effect: "1. That sheep exhibited for any of the prizes must have been really and fairly shorn bare after the 1st of April in the year of the exhibition; and that the date of such shearing form part of the certificate of entry. 2. The committee further recommend that two inspectors be appointed by the Council to examine the sheep on their admission to the show-yard, with instructions to report to the stewards any cases in which the sheep have not been really and fairly shorn bare." Nothing could promise better to correct the abuse than the suggestions embodied in this brief but well-written Report. The

condition that the time of shearing shall form part of the certificate of entry should act in much the same wholesome way as the certificate of soundness has done with the horses; while the appointment of Inspectors will, in like manner, relieve the Judges of a duty not properly within their province. It should be a standard principle with all our agricultural societies, that animals not in a fit state either from fraud or disease to go before the Judges should be disqualified and debarred from entering into competition. At large meetings like those of the Royal Agricultural Society and the Smithfield Club the Judges have quite enough to employ their time in selecting the best for make, shape, and breed; and we believe that the system of preliminary inspection will act as well with the sheep as it has already with the horses. Of course the Inspectors must be able honest men, who will feel it not only a duty but a pleasure to reject a sheep whose symmetry, like that of a spongecake elephant, is due to a "mould of fashion," and whose leg of mutton is made up of frowsy old wool and all sorts of nastiness.

It must not be assumed that the Royal Agricultural Society is by any means taking a lead in this way, as some stringent regulations have already been adopted by other associations, as, for instance, the Midland Counties and Staffordshire. The Royal, however, has hit the happy medium in not attempting too much, and only insisting on a fair bare clip after the first of April. Here there is something tangible to go on; whereas it would be rather difficult to define what is or what is not trimming, as to prevent any exhibitor "touching up" his sheep during the three or four months subsequent to the clean shearing. Indeed, the Staffordshire Society has just got into hot water, in this wise. At the recent show the best Shropshire ram was disqualified by the Judges, though not without some difference amongst them, as having been trimmed since he was shorn. Curiously enough, this animal turned out to be the property of Lord Dartmouth, who has been a determined opponent to all modelling and trimming, and who carried a motion against the practice at the Birmingham Meeting some two or three years since. The shepherd declares that the sheep had never been touched since shorn, and some well-known breeders have also testified to the same effect, while the very Judges lodged a protest at the time of disqualification against the condition under which they acted:—"The Judges of these classes desire to call the attention of the Committee to the rule as to the shearing and trimming of the sheep exhibited. They entirely approve of the first part of that rule, which requires that the sheep should have been fairly shorn after a certain day, and they believe that this would secure the object of the committee; but

they do not concur in the expediency of the prohibition of trimming afterwards. It is very difficult in some cases to pronounce with certainty that it has been done; and acting on the understanding that the rule was to be construed strictly and literally, we have disqualified one animal, undoubtedly the best in the class (No. 137), in the belief that it is not as left at shearing. At the same time, we should be sorry to say, with certainty, that it is so; the rule as it now stands entails difficulties which the judges think they should not be subject to. If it is to be adhered to, they submit that these difficulties should be met by Stewards appointed for the purpose—not by the Judges." This protest, it will be seen, points directly to the principle now recommended by the Royal Agricultural Society—to insist upon fair shearing after a certain stated time, to shift the duty of disqualification from the Judges to other officers, and not to attempt to carry out any proviso against mere trimming. Any such line, however, between the one report and the other, may at least in some measure be accounted for. The judges at Stafford were Mr. Woods, Mr. Meire, and Mr. Randell, and the last named of these is one of the Shearing Committee of the Royal Agricultural Society. Or, even beyond this, Mr. Randell was also one of the sheep judges at Worcester, where, in the absence of any such wholesome rule as that now recommended, he awarded premiums, amongst the Oxfordshire Downes more particularly, to sheep so smothered in old wool that their place on the ground was alike an anomaly and an absurdity. As Mr. Dent reports, "I should think many of the sheep had never

been truly and fairly shorn, and this was more especially the case, as it seemed to me, in the Oxfordshire Down classes," although "this delusive shearing belongs more or less to every class, many of the Cotswolds and Shropshires being glaringly conspicuous." Mr. Randell was also in authority at Worcester over the Shropshires, so that his experience by this must tell him pretty well what to ask for and what to avoid. The report of the Clean Shearing Committee of the Royal Agricultural Society is manifestly grounded on the best practical experience, and it was adopted in Hanover Square on Wednesday, without either Lord Walsingham or Mr. Rigden offering a word in opposition to its object.

It would appear, however, that some other exhibitors are not so well pleased with this wholesome reform, and that at the approaching Birmingham show an attempt will be made to offer private prizes to "shepherds for the best-trimmed pen of Shropshire sheep;"—"that any sheep that has not been fairly barely shorn shall be non-eligible;"—as also "any sheep that has had the wool made filthy and untouchable, by grease, ochre, &c., so as to spoil the trousers of a gentleman, or ruin the kid gloves of a lady,"—and so forth, clearly showing the animus with which the correction is received in some quarters. It will, of course, be the business of the Council of the Midland Counties Society to see that any unfairly-shorn sheep are non-eligible for any rank in Bingley Hall, while it will be equally the duty of the same executive power to prevent any unseemly interference with the conduct of the Meeting.

THE WIRE-FENCE DIFFICULTY.

There is a matter just now being agitated in the great grazing districts, the discussion of which threatens to create some ill-feeling between the two important classes of landlord and tenant. It appears that, amongst other modern improvements, the use of wire for fencing has been found more economical than the once popular post-and-rail. But, unfortunately, however effectual wire may prove in stopping the career of a bullock, it is a yet more decided impediment to the passage of a horse; or, in other words, no man can cross a country where this kind of fencing is suffered to remain up during the winter or hunting months. As something of a consequence, at the commencement of the present season the following protest was extensively circulated:—"We, the undersigned land-owners and sportsmen in the counties of Leicester and Northampton, have observed with deep regret the increasing practice of fencing with wire as a substitute for rails, as well as for stopping gaps. This kind of fencing is so dangerous, both to horses and their riders, that if the custom becomes general it will entirely put an end to fox-hunting. This we cannot imagine to be desired by the farmers in general, many of whom are sportsmen, and all of whom have an interest in the sale of horses, as well as in the residence of a large and opulent body of gentlemen within their district. We therefore earnestly request the tenant-farmers to consider whether it may not be advisable (if not permanently, at least from the month of November to April) to discontinue this mode of protection; and we shall feel much obliged to any who will set the example." Notwithstanding the many well-known signatures attached to this circular, its dissemination so far does not seem to have been attended with much effect, simply from there being no practical suggestion as to how any general removal of the wire could be ensured.

If one man did attend to the request thus conveyed, and his neighbour did not, the evil would be as far from a remedy as ever. What was clearly required was some organized system for seeing to all the wires being taken up in different districts during the time named; and, noticeably enough, this was the course recommended by the sporting authority, *Bell's Life*, when the subject was broached more than a year since. It was there advised that a committee composed in equal proportions of members of the hunt and farmers of the county should have the direction of a wire fence fund; and this principle has since received the sanction of many of those most interested, that is of the farmers themselves. Mr. E. A. Paget, of Thorpe Satchville, near Melton Mowbray, thus ably deals with the point at issue: "It is well known that the maintenance of fences is an expensive item in the labour bill of a farm, particularly where it consists principally of grass land with old enclosures. After a hedge has been cut, laid, and bound, at a cost of from one penny to twopence per running yard, it is necessary that it should be fenced on both sides, to prevent the stock eating the young shoots as they grow, and thus rendering of no avail the money already expended. The old plan was to scour out the ditch, making a bank on the edge of it, and thereon setting a dead hedge to protect the side on which the live hedge had been cut, whilst the other side was back-fenced with single post-and-rail; making altogether a respectable ox fence, quite enough for a horse to cover and keep on his legs. Now, just consider the expense already incurred, and reflect on the mortification of the grazier, who, on going round his farm some hot day in July, finds, on one side, his back rail broken by the rubbing cattle, and, on the other, his ditch invaded by a herd of beasts cropping the young shoots, or madly rushing about to rub off the gadflies! Under these

circumstances, can we be surprised that in these days of agricultural improvement, fostered by societies under the patronage of all the great landlords of the kingdom, the grasier should look out for some more effectual mode of protecting his fences? and if he finds wire to answer his purpose, is he to be debarred from using it because, perchance, the hounds may cross his farm some half-dozen times during the season? Or, is he to be accused of setting snares to catch live lords, or to put an end to the noble sport of fox-hunting, when he is doing the best he can to improve his fences, in order that he may keep the stock of one field separate from the stock of another? Many sporting men say, 'wire is not found to answer': let that be satisfactorily proved, and it will be discontinued; but in the meantime it is sought to prevent the use of it by threats, by coercion. This is not the way to keep up the popularity of fox-hunting amongst the yeomanry of England, upon which, I may say, its very existence depends. The nobility and gentry who hunt in the shires have, it appears to me, a simple remedy for the evil in their own hands. Let them not be afraid of putting those hands in their pockets. The village blacksmith would take up the wires and put them down again, at a cost that would not be ruinous. If foxhunters are too selfish, too near to pay for their own amusement, they deserve to lose it. It has been stated that such a course would encourage the use of wire-fencing. It is of no advantage to the grazier to have his wire-fence taken up—for his own purpose, he would prefer that it remained; therefore its increase and continuance ought to depend on its utility and economy alone. It is possible that some might then adopt it who have hitherto been prevented by their landlords; but, I think, for the next twenty years, about £2 per parish would cover the expense, so I hope we shall hear no more about hunting being stopped by so paltry a cause." Another letter, also from the pen of a farmer, has more recently been published, echoing the proposition already referred to as to a committee of squires and farmers, as well as Mr. Paget's opinion as to the impolicy of any attempted coercion: "Clearly understand that from the number of independent freeholders it is impossible by the coercion of landlords to remove the nuisance, and though in some cases that influence would be brought to bear with success, a feeling of opposition might be raised among the occupiers which independent owners would assist them in indulging." To demonstrate that this warning is by no means uncalled for, we have but to quote from a writer styling himself *Fairplay*, who gravely propounds that "were some new system of farming introduced to-morrow by which the rearing of game became impossible, that system could only be met by the landlord putting his veto against it on letting his land. Surely the same power could now be exercised if the large landed proprietors in the midland counties united their efforts and agreed together for the future to let no grass farm without the condition in the lease that from October to April wire-fencing should be illegal." How admirably conciliatory and temperately this is put, and yet the same strain is indulged in by many others, who, most probably, like *Fairplay* himself, have not an acre of land in, or the least possible sympathy with the county out of which they get their sport. This, in fact, is the curse of modern fox-hunting. The Fields are often ten times as numerous as they were forty years since; the increased company being in a great measure composed of people who just run down for a day and

then back again; often enough even taking their horses with them in the same train. "Scarlet-coated who shall I call them?" as the Leicestershire farmer says so truly of them, "who ignore the courtesy they meet with both from owners and occupiers of land, and fancy their noble presence a sufficient recompence for the damage they cause, and the abuse they heap upon any one who, frequently without thought, has locked his gates or otherwise impeded the progress of their hunt." A deal of good such gentlemen as these must do to a district, and yet one would be led to imagine from the nonsense that has lately been written, that the farmer would be half-ruined but for the patronage of such customers!

Let there be no mistake about it. Farmers always have been, as we hope they always will be, the best friends to fox-hunting. At times they are very martyrs in the cause, but as a body true and staunch in their allegiance. There are cases as common as blackberries in most countries, where my Lord's or his Grace's coven, "good sportsman" as he may be, are inaccessible until after Christmas, out of regard for the pheasants. The Sledmere side of Lord Middleton's country was for years forbidden ground, in consequence of the late Sir Tatton Sykes keeping a stud of brood mares. Battlemongers and race-horse breeders may keep the fox-hunter at arm's length: but when does the farmer do so? Does he issue any veto soon after Christmas out of regard for his lambing ewes, or his cart colts, that have been pounded in the next parish but two? Or, does he expect to be paid, as many a nobleman does, through his servants, half a guinea a head for every fox found on his holding? The hounds, on the contrary, have been whipped out of the tenant's standing corn when cub-hunting this autumn, and a month later on you come and you go when and where you like; while he walks the puppies, looks to the litters, and has a hearty welcome and glass of good ale for you, come as often as you will. In truth, as a master of hounds, Sir Velters Cornwall, said in public but two or three days since: "It was to the farmers that they were indebted for the sport they had had and for the excellent pack which they had been enabled to collect together, and where they had found a lot of foxes and had had good runs it was where the farmers had taken care of them." The pack was now worth four times as much as it was some time ago, and for this reason—that the farmers of Herefordshire reared the puppies, and instead, therefore, of having a drafted pack they had a pack of young hounds, and he saw one just now at the door which showed how the puppies of the Herefordshire pack were reared." Is it wise, in the face of so well-earned a character as this, to ask more of the farmer than that he already gives so cheerfully? All our agriculturists are not sportsmen, but almost all have a feeling for sportsmen; whilst those we have had an opportunity of consulting, some hunting men themselves, are unanimous in considering that the wires should be removed and replaced through a committee and fund established for that purpose. We feel very certain, however, that the longer this discussion is continued, the less good will come of it; and consequently the sooner the difficulty is met in the only effectual way in which it can be met, so much the better for the national sport of this country. We must emphatically repeat that no class in the state does so much to maintain this pastime as the farmer, and that he is therefore justly entitled in his own pursuits to some of that consideration he so liberally allows to others.

THE DWELLINGS OF THE FARM LABOURERS.

At the Wokingham Society's meeting, the farm labourers' dwellings were viewed from so many points by the different speakers, that we cannot let their observations pass without recording them.

The Rev. Mr. MORRIS very properly opened the question. He alluded to the subject of the labourers' cottages, and expressed a hope some improvement would take place with reference to them, as he believed nothing would tend more to improve the moral condition of the poor than neat and comfortable cottages, and said that at present nothing like decency or propriety could be observed in many of the dwellings occupied by the farm labourers.

Mr. BENTON said: Referring to the more immediate object for which they met there that day, let him call their attention to a subject which had already been adverted to by their friend Mr. Morris, namely, agricultural labourers' cottages. He freely admitted that the question was most emphatically a landowners' question. It had been said—and truly said—that cottages formed part of the furniture of a landed estate, and it was the duty of a landlord to find good and comfortable lodgings as much for his labourers as for the beasts and pigs of the farm. But that was not all. There was still a great deal more to be done. The labourer must be taught to appreciate the full value of cleanliness, ventilation, and decency. There was no use in giving a horse to a man who could not ride it. They might just as well give knives and forks to a Red Indian, who would evidently make use of the argument that "knives were made before knives," and would continue in the course which he had been accustomed to from his infancy. The labourer must be taught the advantages of decency and separation. Take the common instance of a modern cottage with three bedrooms. How often was it that the third bedroom was occupied by a host of lodgers, and in the two remaining rooms were huddled together the whole of the family, thereby perpetuating the system which they all deplored, and which the cottage itself was built expressly to eradicate. He said it was necessary to create in the agricultural labourer a feeling or a desire to avail himself of the advantages which were offered to him by those new cottages. The village school was one powerful engine for this purpose; and, when they came away from school, let the agriculturist and farmers be always encouraging both boys and girls to go out to service, and to learn the duties which must be useful to them in after-life. The reason of his calling their attention to this matter was simply because that, while it was very true the question was essentially a landlord's question, and they had certain duties to perform, the farmers had also duties to perform, in discouraging the employment of children in field labour, and in encouraging them to go out to service; and the labourer had his duties to perform, in endeavouring to inculcate those principles which it was desirable to instil into the minds of young people.

The CHAIRMAN (Mr. George Russell) asked: Was there no other way in which they could improve the labouring man? The answer would occur to them, "We can give him good cottage accommodation." Mr. Morris and Mr. Benton had alluded to that; and it had recently attracted the attention of the public press, and had been the subject matter of discussion in all the agricultural associations. Many of them were British farmers, and they liked to look the truth honestly and fairly in the face. Let them take the case of a cottage standing by the roadside, very likely pretty to look at outside, but possessed of very indifferent accommodation inside. The poet and the artist riding along the road might stop in front and remark—the artist to the poet: "Dear me, how picturesque; I must take a picture of that;" and the poet would write a poem, and fall into ecstasies over it. What a capital old gable end for the artist, and how finely the little children came out, and the old grandfather smoking his pipe, and the young one, perhaps, making up to the old man; and this the artist

considers a fine picture. But the philanthropist came down from London, saw the cottage, and said, "Dear me, this is very shocking: five children, father and mother, and grandfather and grandmother in two bedrooms;" and he made up his mind to write to the *Times*, and complained of the gross neglect of the English landlords. This gentleman he (the Chairman) would designate a cheap philanthropist, because he lived ten yards from dens more overcrowded and fifty times dirtier, and never said a word about them, because, if he did, upon him would fall the burden of repair and giving them better accommodation. He had merely drawn these two pictures because he thought the honest truth lay half-way. These things were not improved either by speaking in ignorance or misrepresenting the real state of affairs. He remembered, some weeks ago, of having seen in a copy of *Punch*, the picture of an agricultural labourer looking over into a pigsty, with a pig inside, and expressing a wish that he was as well housed. He (the Chairman) looked for another animal with long ears, which had been left out, and that was the picture of the artist himself. This was a wilful misrepresentation of the real state of affairs. Everybody who knew the truth knew that the labourer would be very sorry to let the pig into his cottage, or take the place of the pig; nobody could doubt that the cottage accommodation was greatly improved. He did not think any gentleman in that room was to blame, and they would all notice that the new cottages which had been built were extremely good; and he thought they would further see that, so far as landlords and freeholders had power of doing so, they were willing to make the necessary improvements. Often freeholders and landowners got abuse when they were not to blame. The houses might have been built for centuries before they came into possession, and then speculating builders might buy a little plot of building land, and run up a row of new cottages, not such as the landowner could wish; and he must either go into the market and buy up land at a fabulous or ridiculous price, or allow the land to be sold, and cottages run up which were not such as they ought to be. He did not like to see abuse given where it was not deserved. At the same time, he hoped they would take the abuse in perfect good feeling, and see if they could not honestly and earnestly endeavour to improve the comfort and the prosperity of the labouring poor.

Mr. GARRARD said he had, on a late occasion, visited Ireland, and, if they saw the wretched cottages there, they would perhaps be more satisfied with those in England. He did not say they should not improve those in this country. They should do everything they could to improve them. For the last fifty years there was no class of men less improved than the agricultural labourer. It had been the object of this country to improve the position of the soldier and those who assisted in maintaining the welfare and grandeur of England; and he was sure the gentlemen landlords were anxious to assist the labourers, and they must also be assisted by the farmers.

At the Wigton Farmers' Club Meeting, the accommodation of the labourer was almost the only topic. The Chairman, Sir ROBERT BRISCO, said what they wanted were buildings that would promote decency, morality, health and strength, and invigorate the constitution. Neither Gothic nor the flowery Italian style of architecture was necessary, but a plain substantial building. If a man with plenty of money chose to run racehorses, let him; if he chose to deck out his "model cottages" in all this finery to show his London friends, he was welcome to do so; what was really wanted was square walls, with plenty of room, large windows, and a very commodious door. He did not believe they would ever cost the money that was calculated. It was the bounden duty of the landed proprietors, large and small, to provide this accommodation for the labourers upon their estates. Throw off beauty if they liked, or stick beauty on if they would, but let them remember to put no more capital to rent than that which was absolutely

necessary to secure healthy accommodation. It was of great consequence to put a man in a position to bring out his fine parts. If they got a man who was suffering from hunger and thirst, weary of being kicked from pillar to post, and tried to get work out of him, it was of no use. They must put him in a position and under circumstances that would appeal to his physical comforts, and after that everything around him would work upon him to a good end. The pride of the man would be awakened; he would meet you with an intelligent countenance, would listen to and weigh well what was said, and would be as competent to judge as you who put it to him. You began at the wrong end to commence the work upon the mind instead of its physical well-being. His own experience as a manufacturer had shown him that if they wished to get the most work, and a profit-giving work, out of a hand, they must remove all physical miseries—that the vigour of the workman should be intact; never let a workman shiver and wish soon to be “out of this.” If they gave a man a warm and comfortable atmosphere—good light and breathing atmosphere, they would find that they elicited a degree of excellence never attained in any other way. They must give home comforts to their labouring people to enable them to be comfortable in their physical department, and then they might hope to work upon their minds. They must prepare the way for the clergy. The clergy could not build these fancy cottages. The landlords must provide the cottages; the farmers would see them well tenanted, and that there were proper habits in those cottages. Talk of the cost! Let them build what was necessary, and keep the fancy cost down; that was all that was required, and the rent department would come in quite sufficient to satisfy the landed proprietor. They had no right to say they would have 5 or 6 per cent. in hard rent for their outlay in such works as these. Would they not get their profit in the honest work of a willing man, living on the spot, who would look up to them as his friends for life? would not this return be worth more to them than the jingling sovereignty when the rent-day came? Only consider the mind of the man, working in the rain, with a prospect of 5 or 6 miles' walk home, with a certainty of being drenched to the skin; his labour would be worth nothing, for he would foresee what he would have to go through, and take care not to overtask himself while at work. It was not then a mere money question at the end of the half-year in the shape of rent. It was exactly like drainage. Nobody could estimate its results, but they came nevertheless. He had calculated in vain; one year he might not have the return anticipated, but the next year it would come twofold or more. Even as the profits of good farming came insensibly from accumulated sources, so having the labouring population close upon the spot produced its good results; it was impossible to say in what precise way, but that it did so was beyond all doubt. Then there was the bad law of settlement, as it had been called; and the close parishes. What had been the result? His own experience once was that in those close parishes poverty had been increasing and increasing. He had seen returns which proved to him that the close parishes, where labourers had been thrust out in the open parishes, were going down in value, and the tenantry were of the lowest and most despicable description, whereas in the open parishes both landowners and tenantry were as a general rule prosperous alike. If they wished to prosper themselves, whatever they did, let them bring labourers of the best character into the district, and the best temptation to this was to provide them with creature-comforts

in the shape of good healthy cottages, close to their work. The landlords, he said, should therefore take the burden upon their own shoulders. Mr. Lawson's heart, he knew, was a good one, though he might be mistaken in his view, and he would press upon him the responsibility as a large landowner, for it was of the utmost consequence that the large landowners should be impressed with a due sense of their position. Let the rest do what they would, individually their power was but limited compared with the large landowners. He believed the foundation of the improvement wanted in labourers' service was the element of cottage property upon the various estates.

Mr. Canon HODGSON said if they wished to improve the character of their labourers, good residences must be built, call them by whatever name they chose; they must have three bedrooms—one for the boys, another for the girls, and another for the man and his wife, and a large sitting room as well. The landlords ought to look fairly at the circumstances of the case, and not think merely model cottages were required; they could not expect to improve the habits of the people unless they supplied them with the necessary conveniences. If they would have a decent division between the sexes they must have three bedrooms in the house, a sitting room, a pantry, and a sink. He had been struck with some cottages that a friend of his had built at a cost of £190 the two. He had got the plans of them in his possession, and if any gentleman liked to avail himself of them they were at his service. They were quite simple in style, and without any of the unnecessary ornaments which the chairman had so justly ridiculed. He said that if they hired men into the house they ought to be single; and if they wished to have a married one they ought to provide him with a comfortable cottage. He was sorry to say, that he differed from the Chairman as to the close and open parishes. For twenty years he had lived in an open parish, where there were five close parishes surrounding, which belonged to wealthy men, whose object was to drive the useless labourers into the open parish in which he lived. He could not say that the consequences improved the character of his parish, for when a man was guilty of poaching or stealing, or became a drunkard, the first step was to order him to leave his cottage in the close parish, and he was driven into the open parish, and added a great deal to the difficulties which he as a clergyman of the parish had to contend against. In this way the poorer inhabitants of the open parish were men of damaged character. If they went to the South also, they would find the system adopted in the close parishes was very much to the detriment of the open parishes.

Mr. LAWSON said he fully agreed that it was the duty of the landlord to provide accommodation for the labourers on the estate, nor had he in the least intended to hint otherwise, or disagree with that opinion. All he meant to say was that in the course of education the men would be so much improved as to insist on better accommodation. He thought that rather more weight had been laid upon the cottage question than necessary. As a public question, looking at it as a whole, he did not think they would succeed in raising the general tone of the population by building cottages for them (“Oh, oh”). That was a duty for every landlord to consider, though he did not think it would be so largely followed as some might anticipate. At the same time he repeated that when they raised the tone of the people they would insist upon being better lodged. (“No, no.”) That was a duty for the clergy to consider.

WHY FARMERS OBJECT TO AGRICULTURAL STATISTICS.

At the Loughborough Society's Meeting the Venerable Archdeacon FEARON said: He had always had a great admiration of agricultural societies, and he said that the Royal Agricultural Society had done its work most successfully; and all classes of society were deeply indebted to that and other societies for what they had done in promoting scientific and practical farming. But there was much yet for these societies to accomplish, and he had no doubt that in time they would

accomplish it. He could not help thinking that the dissemination of information respecting the crops would be extremely useful, and he could not but think that some day or other, if it could be done, it would be found a most valuable thing that information should be spread throughout the country of the crops that might be expected during the coming year. He sincerely held that opinion. (Cries of “No,” “No.”) He did not believe that any injury would be done to any farmer living,

whilst a great deal of good would be effected by the publication of these statistics. In all other departments of knowledge a great amount of benefit was derived from the publication of statistics, and he did not see why farmers should be excluded from that advantage. In the progress of sanitary knowledge a great amount of benefit had been derived by the publication of facts which enabled them to judge which was the diet best suited to the human frame in different climates and what the best system of practice. He did think that the farmer and the dealer and the public would derive equal advantage from the publication of agricultural statistics, provided there was nothing objectionable in the mode of collecting those statistics. If that were true, it was especially so in the circumstances in which the country was now placed. There would be a deficiency of productions in the coming year in that great country, America; and even Poland, from which a considerable supply of corn was taken every year, was now desolated by war; that being the case, if their own supply was to fail there was less chance of getting a supply from them. And at this present moment it struck him very strongly that they ought to know where they stood. The census told them how many mouths they had to feed; and he thought it was only right that they should obtain agricultural statistics, to enable them to ascertain what they would have to feed them with. This was his sincere conviction, and he held that a man was no good unless he freely expressed the opinions he entertained.

Mr. C. W. PACKE, president of the association, said: It has struck me very forcibly that in the different societies which have met in different parts of the kingdom there has been a difference of character to what there used to be in days gone by. They partake more of a political character than of a business character. There have been meetings in Cumberland, Somersetshire, Berkshire, Oxfordshire, Norfolk, Rutlandshire, Huntingdonshire, Herefordshire, Warwickshire, and in this county. At many of these meetings there have been different speakers, who, not content with discussing affairs affecting agriculture, have launched out into the sea of politics, which I consider quite foreign, and which I have always considered foreign when broached in this room. They have gone into topics which are little suited to agricultural meetings, and in some cases allusion was made to what my reverend friend the Archdeacon has alluded to, namely, agricultural statistics. With due regard to my very reverend friend, there may be some reason why a person's private concerns should not be opened to the public generally. I have never heard it stated, and never read in any publication that those returns which would involve a strict investigation into the private affairs of individuals would result in any benefit to the British farmer. Just let us consider, if we can, calmly, the positions in which the public and the farmer are placed. Take the position of a mercantile man. Is there any shopkeeper who would like a person to go into his shop and examine everything that he possesses, and see exactly how he is situated? That is nearly what is wanted respecting these agricultural statistics at the hand of the farmer. I am not at all prepared to say that to the corn importers and others it would be necessary and desirable that they should know what quantity of corn is produced at home so that they might know what they have to depend on, and only import what was wanted and get a good return for it. I wait till that question is answered to my satisfaction before I can become an advocate of the British farmer being compelled to let others see what he has got, and allow persons to survey his farm, and before I can say I believe that such proceeding would be a benefit to him. I hope I am not saying anything against the argument that this would be of benefit to the country generally, but I think that those who are most interested in their affairs being looked into should be first satisfied that it is for their benefit. Among the different things that have been talked about at the recent agricultural meetings, I have observed in more than one or two places that we have been recommended that, as the prices of wheat are too low, to give up growing wheat, and to convert our arable land into pasture, and grow green crops. Now the question arises what situation would we find ourselves in, if we abandon corn and turn our land into grass? How are farmers to get on without

straw? It would be simply impossible to get on at all. We could not manage our farms at all, if we are to deprive ourselves of the advantages arising from growing corn; and therefore I say that those who talk in that manner know very little about the succession of crops and the use of them, when they say that we should do away with our arable land and turn it into grass. It is very well known that there is a great deal of land in this country, which would not be fit for grass, and is only fit for arable purposes. We had a speech from a Royal Duke—the Duc d'Aumale—at the meeting of the Vale of Evesham Agricultural Society. He (the duke) said: "There is a circumstance connected with these undertakings which I may notice, and which is peculiar to this country—I mean the entirely unofficial character of the meetings. You manage for yourselves here your own business. You do not require any superior assistance or interference, and I believe that upon the whole the advantages of this system are greater than its disadvantages—if there are any disadvantages. I heard the other day of a meeting that was held in a place of which I like better to talk than to name, at which a friend of mine who was presiding said something which did not answer the purpose of a high official, and who was suddenly stopped in his speech by the tremendous beating of drums. Happily, nothing of that kind is to be found in this country, for if any one trespasses beyond the boundaries of his oratorical rights, you perfectly well know how to bring him to order." The Duke also referred to the fact that farm buildings in England were not on so extensive a scale as they would be for farms of the same extent on the continent. Now, although his Royal Highness made on the whole an excellent speech considering the circumstances in which he was placed, I think he did not make sufficient allowance for the difference between the French and the English agriculturist. An honourable friend of mine (Sir E. B. Lytton), speaking at another agricultural meeting, said: "A very eminent authority (Professor Gamgee, of Edinburgh), at the International Congress of Veterinary Surgeons, at Hamburg, has lately given the statistics of mortality among our stock, and his account is startling. He says that the estimated total value of stock which died of disease in Great Britain and Ireland, during the six years ending 1860, amounted to nearly £24,000,000 sterling; while the value of foreign stock imported during the same six years amounted only to £4,500,000; so that the nation lost four times the value of the stock it imported. Professor Gamgee ascribes this calamity principally to the introduction of foreign cattle, and justly observes that, 'though not desirous of stopping free-trade in stock, the prevention of so much disease, and the saving of so much money to the nation, is a matter of serious and paramount importance.' Mr. Gamgee suggests that any persons who have found an effective remedy for these diseases should make it public for the benefit of all; and perhaps we may hear from some of our practical friends what, in their experience, has been the result of inoculation. If I may, with great diffidence, mention the effect of a very limited experiment of my own, I would observe that, at a place I have near Totteridge, I had five cows out of ten attacked by lung disease. But I have not had one so attacked since I tried the experiment of inoculation. Let me add generally that I think many of us do not pay attention enough to a very simple preservative of health in all animals, which is recommended by a very high authority—I mean the admixture of salt in the food, whether of cattle, horses, or pigs. They all take to it kindly of their own accord; and, where a piece of rock salt is placed in their reach, they do not take more than their instinct suggests as beneficial. Professor Gamgee recommends a dose of Epsom salts to all cows previous to calving, as a valuable preventive to the milk fever, to which cows are subject." These remarks are entitled to your attention; and I would add to them something from my own experience. It is, that I always find there is some disease in the cattle I buy at fairs. I scarcely ever bought a head at a fair that, in a fortnight or three weeks after I brought them home, were not taken ill. I have a considerable number of good animals, as you are aware. I believe some of them are the best breeds in the kingdom; and I shall, if it please God to spare my life, retain the purity of these animals; and, if others imitate my example, they will escape from the evils which I have described, and from the diseases which affect stock purchased at fairs.

PERFECT TILLAGE c. PSEUDO-PRINCIPLES.

"Perfection," it is said, "does not belong to the province of fallen humanity." The truth of the adage need not be called in question any more or less at the present time than when it was first promulgated: at the same time, it must be granted that progress in the direction of the winning-post has unquestionably been made. The moral of the maxim is, to leave all questions open as comparative ones; and, no doubt, the problem of *perfect tillage* at the head of our paper is no exception to the common rule of all sublunary things. The reader will, therefore, understand that our proposition is not the perfection of the practice involved, but an inquiry into the fundamental principles upon which it is founded.

How should this or that quality of soil be cultivated so as to produce the heaviest crop of the best quality? has long been one of those time-honoured questions amongst farmers that involve many practical considerations. The great barrier to progress in its more perfect solution is routine, or the force of local habits, that completely counteracts every rising energy having a tendency to leave the beaten track of the past for a better. In other words, there is a large number of practical agriculturists who, if they have not got the length of perfection, have, at least, got so far that nothing better has up to this time been discovered. It will readily be admitted by them that Mr. A. beats Mr. B. as a farmer, and that Mr. C. is rather a-head of the more fortunate of the two; but then there are substantial circumstances that satisfactorily account for all differences of this kind, so that upon the whole the general practice pursued is really without a rival. There always has been a wide difference between South and North, East and West, and doubtless distinctive characteristics of this kind will continue; but, taking localities as they are, their natural individuality may be summed up as *change*; or, perhaps, in the language of an old Roman poet who flourished before the Christian era, viz., HORACE:

"Rusticus expectat dum defuist amnis, at ille
Labitur et labetur."

As it is with the general practice, so is it with the several points that comprise the whole. It is not so much the force of principle that determines the *modus operandi* as the force of habit. From this there are no doubt many exemplary exceptions. But why should the force of habit be the rule of practice to any? Instinct leads certain animals to follow each other in the line of progression; but with soil and circumstances so diversified, it is rather remarkable that in farming the imitative art of the lower creation should be so closely followed.

But what are the fundamental principles of tillage, it may be asked, that practical farmers should be governed by them? What are those laws of Nature that should guide the agriculturist, as he turns up this or that quality of soil to the weather? If to-day is not to follow in the wake of yesterday, according to the exemplary rule of the past—or, to speak plain, as geese fly—at what tangent of the circle are we to leave the time-trodden track of our forefathers, in the peradventurous journey of the future?

Questions are easily put, but often not so easily answered; and those relative to the principles upon which different qualities of soils should be cultivated, manured, and cropped, under all the circumstances of the case, are as yet surrounded with much that has to be discovered. Even in examples of the most successful practice, the farmer may feel confident of success, and yet be unable to say upon what principles that success is founded; and this is not more applicable to ploughing than to any other operation of tillage, as harrowing, rolling, drilling, hoeing, manuring, &c.

The obvious inference to be deduced from the last paragraph is this, that *practice is, after all that has been alleged to the contrary, somewhat ahead of science*. Our best practical farmers, for example, know more about the theory of their profession than do our scientific ones, who write *rules for farming* with so much *any froud* and volubility of diction. Upon paper, or in the lecture-room, or in conversation, the latter know everything, but in the field comparatively nothing.

With the farmer it is the reverse, for they are at home in the field; but even there they cannot clothe their ideas in language to make themselves understood by those only acquainted with books, while out of the field the exposition which they give of their practice is often the most tedious routine imaginable. Of this they are not ignorant, but they cannot, as it were, help themselves, the discoveries made not having as yet been recognised by science, while the principal facts of the case remain *incognito*!

The rationale of this must be very plain to those who can give it a moment's practical consideration. Thus, in the field example is the rule, not *principle*—"Do as I do," or follow the example of any other ploughman or farmer, if such is more worthy of imitation. Who would ever think of teaching a newly apprenticed tyro otherwise? for to do so would be an exception to all rule, agriculture itself not excepted.

The two extremes which we have thus to examine are wide, wide asunder, and between them (*book-rule and successful field practice*) there is a modern *pseudo-example*, yclept "*amateur farming*" or "*model farming*," whose motto is "*practice with science*!" That furnishes more amusing instruction than either—more amusing because a hybrid of the two former, the extremes; the amateur capitalist having a successful practical man as bailiff—the one to work and the other to crow.

The principles which form the basis of successful practice is the principal half of the subject of our present inquiry. We purposely introduce the topics of book-rule and amateur farming to show the impropriety of teaching this or that as an exposition of practice, or as the science of farming, before the necessary discoveries have been made upon which such an exposition is founded. The absurdity of such a course is without a parallel, while the harm it is doing in checking the progress of sound scientific inquiry and of improved practice is incredible. Amateur farmers, scientific professors of agriculture, chemistry, &c., may think their conclusions right, and the opinions of many practical men may be largely in their favor. The general conclusions arrived at may even be left as open questions for the more perfect and satisfactory solution of the future. But all this only forms part of the old exploded opinionative system of philosophy that prevailed prior to the adoption of the experimental one of the present day. Now the latter imperatively lays down as a standing rule that opinions are excluded from physical conclusions. In other words, conclusions in physical science cannot be deduced from opinions; for if a single discovery remains to be made in the premises, then the subject is like the links of a chain before they are all made and put together—useless for any practical purpose, and remaining so until the work is finished and the chain fairly completed.

Of course, something must be said in the meantime. In a chain so diversified as that of agriculture, where the links are unlike each other, if we cannot tell what the exact form of the next one may be, we are at liberty to examine those already made, and to raise conjectures as to the individuality of such as are under the hammer, taking care of the fiery sparks that fly about our ears during the process of welding; ever bearing in remembrance that the practical man at the forge cares little for burnt holes in the broadcloth of the amateur or of anybody else who is merely a non-professional looker-on.

In agriculture, the prosecution of experimental inquiry is more than ordinarily subject to speculation, more especially as regards fundamental principles. This arises from much of the artificial and natural processes involved being imperceptible to the organs of sense, so that farmers are left the alternative of drawing conclusions from those results produced that are subject to observation. Thus in experiments with manure, several samples may be applied to the same field. The several plots of land may be of uniform quality to appearance, and also the work of ploughing, harrowing, &c. Now, if under such circumstances one quality of manure produces a better crop than any of the others, it is natural to conclude, from a commercial point of view, that it is the best of the several kinds under trial. But as a question in physical

science, such a conclusion can only be received as an opinion, unwarranted too by the premises, and therefore one that cannot be admitted into the established code of that science, or as having settled anything in the progress of experimental inquiry; and yet the result itself, the quantity and quality of the crop, apart from the manure, &c., are nevertheless sterling matters of fact, that justify hypothetical conclusions of the above kind, and even warrant an infinite amount of speculation, but only as undetermined subjects of inquiry, when coupled with the manure, the growth of the several crops, and the other intervening circumstances that comprise the whole of the chain or question at issue. We see at seedtime the manures before they are applied to the land, together with the land itself, and we also see the crops at harvest; but the crop is not the manure, nor is there any presumptive evidence to say that the latter, by the intermediate processes of which we as yet know comparatively nothing, has been connected with the former. On the contrary, we know, from experience, that part of the manure remains in the soil, because the subsequent crops derive a marked benefit from it. In short, many discoveries have yet to be made in chemistry and physiology before the facts of the case can be satisfactorily disposed of that transpire during the intervening period between seedtime and harvest. We know that processes during this period do take place; that they are subject to much diversity from different degrees of heat, moisture, light, and other natural agents; but of the details of such processes we have as yet, comparatively speaking, nothing as matter of established fact, either in chemistry or physiology. We have, on the contrary, on more occasions than this, unhesitatingly affirmed that they know more of both these sciences than many, if not the majority, of their teachers. As it is with the general question, so is it with the different branches of the profession. They know more from experience in the field than what they can account for in the language of science. They know, for example, that the lifetime of a plant—be it a turnip, a carrot, a cereal, &c.—between seedtime and harvest furnishes an interesting history, consisting of periods of health and sickness, of trials and hardships, certain times of apparent happiness, others of the deepest sorrow and dejection—now suffering the miseries of comparative starvation, to-morrow rioting in over-abundant luxuriance. All this, and a great deal more, they can see and watch from day to day with the deepest interest. Now, although they cannot give a satisfactory account of the peculiar processes in the soil and in the plant, for the reasons already given, that produce such changes, they nevertheless know much of the chemistry and physiology of what is taking place during the time—being often enabled, from present appearances, smell, and taste, to determine with considerable accuracy those circumstances attending the after-period of life, and also harvest results. They even know more than this; for many of them do not hesitate to condemn the organic

and inorganic and other isolated fallacious chemical and physiological theories now being taught by their respective advocates—their objections to them being based on sound principles, although not, perhaps, altogether expressed in strictly scientific language.

What has just been said of the food and health of plants, including the different crops cultivated, is also applicable in principle to the food and health of animals. More fallacious dogmas, for example, were never taught, during the darkest ages of Pagan and superstitious times, than the flesh-forming and fat-forming theories recently taught by our agricultural chemists. The grouping system of analysis is perhaps one of the grossest examples of routine that was ever practised upon the public, and although many have been its suborned dupes, it stands to the credit of the great bulk of the agricultural body, that they never placed any great confidence in it. We question if the per-centage of ammonia or phosphate of lime can be determined with that degree of accuracy to be of any practical use to farmers. Certain it is, that the analysis of both is subject to much improvement; for the present practice is at the best but a rough guess, while the manner it is now being puffed and lauded to the skies as the farmer's infallible safety-valve is doing much to extend the greatly-needed work of progress in this most important branch of science.

The most objectionable feature of all such isolated exclusive theories and routine systems is the absence of that golden link which unites them to practice. Call it a fundamental principle, or what you please; but there it is—plenty of links no doubt, and excellent ones too—but they are not put together so as to form a chain; consequently, as in mechanical cases, they are worthless to the practical farmer, as they will neither haul a plough, harrow, nor any other implement of tillage. Exactly the same fallacious doctrine is taught relative to the food of plants and cattle, for those elements are wanting that unite the known ones together, so as to make the whole available food. It is even a problematical question if ammonia itself is the simple combination of nitrogen and hydrogen, according to the current routine-book-rule now taught. If we mistake not, future discovery at no very distant day will establish the fact, that at present the golden link is wanting that unites them (nitrogen and hydrogen) together, while similar links are wanting to form starch, &c. Exactly the same thing may be said of the almost wonder-working soluble phosphates. Again, rising from the inorganic to the organic world, if such is the case with the former, the inquiry naturally arises, Are all our formative conclusions right relative to the latter? And the plain, practical answer to this is, the broad negative—No!! for the higher we rise in the ranks of organized being, the greater the number of links that are found wanting to complete the chain. In point of fact, as yet it *isn't* a chain at all, but a hyperhallucination of its shadow!

W. B.

SMITHFIELD CLUB.

At a Council Meeting held at the Secretaries' offices, in Half Moon-street, on Wednesday, November 4th, the president, Lord WALSHINGHAM, in the chair; Lord Tredegar, president elect; Lord Berners, vice-president; Lord Feversham, vice-president; Messrs. Beasley, Clayden, Josh. Druce, Giblett, Greetham, Ladds, Milward, Moore, Rigden, Stratton, Robert Smith, Torr, and Owen Wallis, it was resolved to appoint fifteen judges for the coming show, viz:

- 3 for Shorthorns, Scotch, Welsh, and extra stock.
- 3 for Devons, Herefords, Sussex, and other cattle.
- 3 for Short-woolled and Shropshire sheep.
- 3 for Long-woolled, Oxfordshire, Mountain, and Cross-bred sheep.
- 3 for Pigs.

The judges in the above divisions were then appointed. It was determined that the six judges of cattle should adjudicate on the silver cups for the best ox or steer, and best cow or heifer in the show-yard, and in case of equality of votes the stewards to call in a referee. The

arrangements for the adjudication of the other cups were decided on.

The President and Secretary, Mr. Brandreth Gibbs, were requested to select the silver cups.

It was determined that placards be placed on both sides of the boards over the heads of the cattle, and also that the judges should affix small prize-cards, similar to those used at the Royal Agricultural Society of England, over the prize animals, for the information of the members at the private view, and the visitors on the five-shilling afternoon, Monday, December 7th.

It was resolved that the offer of the Vicar of Islington to give a special sermon on the Sunday for the herdsmen and shepherds in attendance on the animals be accepted, and that the Secretary be requested to make the necessary arrangements for the same.

Various letters were laid before the Council, and matters of detail determined upon.

Notices of motion for the next Council meeting were handed in, new member selected, and thanks voted to the president,

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL: Wednesday, November 4.—Present: Lord Feversham, President, in the chair; the Earl of Powis, Lord Berners, Lord Tredegar, Lord Walsingham, the Hon. W. Cavendish, M.P., Sir E. Kerrison, Bart., M.P., Sir A. K. Macdonald, Bart., Sir M. White Ridley, Bart., M.P., Mr. Acland, Mr. Amos, Mr. J. H. Arkwright, Mr. Raymond Barker, Mr. E. Bowly, Mr. Bramston, M.P., Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Dent, M.P.; Mr. Druce, Mr. Exall, Mr. Brandreth Gibbs, Mr. Holland, M.P., Mr. Wren Hoskyns, Mr. Humberston, M.P., Mr. Jonas, Mr. Lawes, Mr. Lawrence, Mr. Milward, Mr. Pain, Mr. Randall, Mr. Rigden, Mr. Robert Smith, Mr. Shuttleworth, Mr. Torr, Mr. Wallis, Mr. Wells, Mr. Burch Western, Mr. Henry Wilson, Professor Wilson, Mr. Frere, Professor Simonds, and Dr. Voelcker.

The following New Members were elected:—

Aveling, Thomas, Rochester.
 Bangham, Geo. A., Bridgnorth, Salop.
 Batchelor, T. B. Maindee, Newport, Monmouthshire.
 Beckwith, Thomas Percival, 52, Eaton-place, London, S.W.
 Birch, Thomas, Grafton Farm, Hereford.
 Blenkinsop, John, Simonside House, South Shields.
 Brandon, Benjamin, Ross, Herefordshire.
 Brett, Wilford George, The Lodge, Esher.
 Bright, John, Longford, Market Drayton, Shropshire.
 Buchanan, David, The Lodge, Clifton, Rugby.
 Burdett, Edward, The Manor Farm, Lyvedon, Thrapstone.
 Burton, Robert Henry Lingon, Chilton Grove, Shrewsbury.
 Burrows, Thomas Ash, Normanton-on-Trent, Newark, Notts.
 Clive, the Hon. Capt. in Geo. W. Windsor, M.P., 53, Grosvenor-street, London, W.
 Colby, S. E., Havod Grove, Cardigan, South Wales.
 Coultas, James, jun., Spittlegate, Grantham.
 Dees, Robert Richardson, Wallsend Hall, Newcastle-on-Tyne.
 Donkin, Robert, Felton, Acklington, Northumberland.
 Draper, Charles, Kenilworth.
 Ealand, John Robert, Aisthorpe, Lincoln.
 Evans, Robert, Tolladine, Worcester.
 Evans, Thomas, Astwood, Worcester.
 Fenton, Joseph, Bamford Hall, Rochdale.
 Gape, George Thomas, Elm House, Winkfield, Windsor.
 Goodwin, Frederick, Droitwich.
 Hotch, Wm. Hepburn, Bratton, Westbury.
 Green, Andrew Whyte, Craig House, Girvan, Ayrshire.
 Gulliver, William, Searcliffe, Banbury.
 Hall, William, Seven Springs, Cubberley, Cheltenham.
 Haines, John, Rotherby, Leicester.
 Hammond, Dr., 11, Charlotte-street, Bedford-square, London, W.C.
 Hamond, Charles Frederick, Newcastle-upon-Tyne.
 Hamood, Philip, East Grinstead, Sussex.
 Hart, George, Wakefield.
 Harwood Thomas, Seletad Hall, Ipswich.
 Hattos, William, Kingston, Totsworth, Oxon.
 Hodgson, James, Liverpool.
 Kingsnorth, Edward, Brookland, New Romney, Kent.
 Lancaster, Thomas, Bownham House, Stroud, Gloucestershire.
 Lloyd, George Woodall, Whitechurch, Monmouth.
 Margesson, Rev. Wm., 4, Green's Row, Chelsea, London, S.W.
 Nickisson, John Stone, Staffordshire.
 Painter, Thomas, Bodlondob, Wrexham.
 Pitt, Walter William, Whitechurch, Monmouth.
 Raglan, Lord, Cefntilla House, Usk, Monmouthshire.
 Ramsay, John Taylor, Walbottle Hall, Newcastle-upon-Tyne.
 Ridley, Andrew, Newcastle-upon-Tyne.
 Rix, John, sen., Laseley Court, Worcester.

Robert, Hugh, Eastgate Row, Chester.
 Royds, Henry, Elm House, Wavertree, Liverpool.
 Smith, John P., Leominster.
 Smith, Tysoe, Hinchwick Farm, Stow-on-the-Wold.
 Splatt, William Francis, Abbotsford, Torquay, Devon.
 Stephenson, William, Throckley House, Newcastle-upon-Tyne.
 Timbrell, Robert, Beckford, Tewkesbury.
 Toder, John, South Muskharn, Newark-on-Trent.
 Vaisey, John Robert, Attwoods, Halstead.
 Wakefield, W. H. Priset, Kendal.
 Walker, G. H., Oakleigh, East Grinstead.
 Watham, Joseph Street, Coalbrook, Ross.
 Wilkinson, Edwin, Isle of Cinder, Leeds.
 Williams, E. Brydges, Nankeval, St. Columb, Cornwall.
 Wilson, William, Oubas Hill, Ulverston.
 Woodall, Thomas, Dianham, Chepstow.

FINANCES.—Mr. Bramston, M.P., presented the Report, from which it appeared that the Secretary's receipts during the past three months had been examined by the committee and by Messrs. Quilter, Ball & Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on Oct. 31 was £2,146 7s. 7d. The balance sheet for the quarter ended September 30, and the statement of subscriptions and arrears, were laid upon the table; the amount of arrears then due being £821.

GENERAL NEWCASTLE COMMITTEE.—The Earl of Powis reported that the Committee had carefully investigated the general plan and appropriation of the ground, and recommended that there be two entrances to the Show-yard, in order to accommodate an influx of visitors from either station.

CLIPPING SHEEP FOR SHOW.—Mr. Holland, M.P., reported the recommendation of the Committee—1. That Sheep exhibited for any of the prizes must have been *really and fairly shorn bare* after the 1st of April in the year of the exhibition; and that the date of such shearing form part of the certificate of entry. 2. The Committee further recommend that two inspectors be appointed by the Council to examine the Sheep on their admission to the Show-yard, with instructions to report to the Stewards any cases in which the Sheep have not been *really and fairly shorn bare*.

The report was adopted.

The Council having received Memorials from breeders of Channel Islands cattle, praying that a class be granted for this breed in the Prize-sheet, directed them to be referred to the Stock Prizes Committee.

A letter on the production of Beet-root sugar, from Monsieur de Lirac, of Algiers, was referred to the Journal Committee.

The following works having been presented to the Society's Library, the Council ordered their thanks to be returned to the donors:—Proceedings of the Boston Society of Natural History; New York State Agricultural Society's Transactions, 1860-61; Ohio Agricultural Report, 1861; Patent Office Report, 1861; Institution of Civil Engineers' Minutes of Proceedings, vols. 19 and 20; The Farmers' Almanac for 1864.

ANNALS OF STEAM CULTURE.

Several districts of Northamptonshire have now been invaded by the steam-plough, and the local agricultural gatherings of the county, usually witness some severe contention between mechanical rivals in the tillage of the soil.

In the little parish of Orlingbury, near Wellingboro', there reside two farmers, who are sufficiently enterprising to start steam-cultivators: one is Mr. Pell, whom I have not yet visited, supplied with Howard's apparatus; the other is Mr. J. W. Watts, with whom I spent a very pleasant day two weeks since. This parish comprises a variety of soils, from the variegated and easily-worked marls which peep out on the hill tops, the mixed sand and clay of the Inferior Oolite, and, in the valleys, the Liassic clay, which varies from a cold wet tenacious blue clay, to a strong and productive clayey loam on the limestone.

This gentleman is occupying three farms, the larger part of the land being held of Mr. A. A. Young, whom he served some years ago as farm-bailiff. Altogether his farm consists of 800 acres; besides his farm he has a large malting, and besides his malting he possesses four or five steam-engines and combined barn-works, which are employed by the neighbouring farmers.

Steam was introduced upon the farm by Mr. Young, the owner of the property, who gave his orders to Mr. Fowler in the autumn of 1861. It was he who commenced the work of preparing the farm for steam-culture, which has been so vigorously prosecuted by his present tenant. All that could be effected has been done, or is in course of execution. The estate is undergoing thorough transformation: the high-backed lands thrown up by our ancestors (who, as I have before said, not knowing how to get the water off the land, adopted the best means of rescuing some portion of the land from the water) are being cast down; the hedges are vanishing; the arable land is being arranged in large blocks by itself, for the most expeditious cultivation, with straight boundaries; and the drainer's tool has already tapped the springs and channelled the subsoil, preparatory to the reception of the tons of fertilising rain that pass through it, now that the pan is disrupted by the ploughshare or cultivator tine.

Of the 800 acres of land 570 are arable and 230 grass. One half the arable land is stiff enough to require four horses to turn a furrow 6 by 9, and sometimes five; and the remainder can be ploughed with three horses, three-quarters of an acre being considered a good day's work.

The first year's experience with the steam tackle was very dispiriting. Mr. Watts could say with Mr. Moscrop "that steam cultivation had not proved a remarkable success." The fact is that the apparatus, as first sent out by Mr. Fowler, was not calculated to bear the strain put upon it. While some parts were too weak, others were too strong; and much time was lost, and much inconvenience sustained while the manufacturer was adapting the different parts to their duty. The loss, in other respects, was borne by Mr. Fowler. Even, with all these drawbacks, Mr. Watts is very well contented to have begun thus early; for a great change, entirely due to the deep cultivation, which is only possible to steam, is being wrought on his farm. His annual expenses are being reduced, and his crops increased; and, in order to cope with foreign produce and low prices, this is what we require. Deep culture would be nothing if it did not tend

to this result; "but as surely," and here I quote from Mr. Moscrop's prize essay, "as cultivation by steam is more economical than by horse, as surely as its use increases porosity and promotes percolation, as surely as it better comminutes and deepens at will the staple of the soil, so surely does the final result tend to the production of better crops, and consequently to greater profits." The tabulated returns contained in Mr. J. A. Clarke's "*Five Years' Progress of Steam Cultivation*" demonstrate this fact in a very remarkable and indisputable way, and prove that the results of practice are quite compatible with the foregone conclusions of theory.

One of the chief advantages obtained by Mr. Watts by the use of steam cultivation is this: Instead of being, as formerly, obliged to diffuse the year's manure over the land intended for beans and roots, he can now concentrate it upon the bean crop, and, by breaking up the stubbles intended for roots directly after harvest to a great depth, allowing the land to be thoroughly pulverized by the frost, and fertilized by the rain and the penetrating air, he compensates it for the loss of farm-yard manure, and applies only a little artificial manure when the seed is sown. Deep soil stirring at the proper time, in place of manure—this is the system. Instead of being left to be broken up, worked, and cleaned in the spring, the operation is performed in the autumn; and the rain, which, with its fertilizing elements, would have run off the solid surface to the furrow, and from the furrows to the drains, now passes right through, imparting its virtues to the soil as it descends to the drains.

The apparatus consists of a 14-horse power locomotive steam engine with clip drum, one four-furrow plough, fitted with digging breasts; one cultivator, one subsoil plough, 800 yards of rope, porters, &c.—Total cost, £1,050, independent of a set of duplicates, wearing parts, and of carriage.

During the 61½ days' work, between the 21st of March of the present year and the 7th of August, the following work was accomplished:—

FIELD.	ACRES.
1. 45 acres once grubbed for oats, with harrow attached (after digging)	45
2. 12 acres subsoiled for mangolds, 18 inches deep	12
3. 12 acres scarified once	12
4. 18 acres twice scarified for turnips (after digging)	26
5. 20 acres twice scarified for fallow crop	40
6. 20 acres once ploughed for fallow	20
7. 20 acres once scarified	20
8. 10 acres dug up 9 inches	10
9. 25 acres dug up 9 inches	25
10. 25 acres scarified	25
	235

In addition to this, some 56 acres of digging have been done for neighbours, at 18s. an acre, so that the quantity stands as 291, or 4½ acres per day.

The work that has been done during the 86 days' work, between the 20th of August and the 5th of October, is as follows:—

FIELD.	ACRES.
1. 12 acres pea stubble, twice grubbed, with harrow attached, sown with mustard and coleseed	24
2. 11 acres wheat stubble, twice grubbed, wheat again	22
3. 10 acres, twice grubbed for mangolds, 10 inches deep	20
4. 20 acres, after wheat twice grubbed, 7 to 8 inches deep, for oats	40
5. 21 acres twice grubbed, 8 to 9 inches deep, for winter beans (manured)	42
6. 20 acres after wheat, grubbed twice, 8 to 9 inches, for beans (manured)	40
7. 30 acres ditto, once grubbed for beans (manured)	30
8. 21 acres after wheat for tares, twice grubbed 7 to 8 inches, 2nd time with heavy harrow attached	42
9. 18 acres after wheat, once grubbed, 8 to 9 inches, for beans (manured)	18
10. 20 acres after beans, wheat grubbed in, with harrow attached, 5 inches deep	20
11. 15 acres after wheat, grubbed once for beans (manured)	15
	308

This calculation shows the rate of working to have been about $8\frac{1}{2}$ acres per day, which is exceedingly good, and a great improvement on the rate of working before harvest. Mr. Watts estimates

The interest on the original outlay, £1,050, minus £300 on account of the engine being otherwise engaged, £850 at $7\frac{1}{2}$ per cent...	£	s.	d.
Annual outlay on new rope	68	15	0
New materials, wearing parts, and engine repairs	80	0	0
Annual expenses	60	0	0
	£153	15	0

Supposing that the days' works amount to 186 in the year, which, allowing for 18 weeks of Sundays, holidays, and rainy days, is about half the year; this furnishes a fixed daily charge for such matters, of £1 2s. 7d. Therefore

The interest on capital, repairs as above	£1	2	7
The wages of men	0	9	3
The cost of horse at water-cart	0	2	6
Coals (including 2s. per ton carriage)	0	9	0
Oil	0	1	0

Gives

as the total daily cost, allowing what is equal to nearly 20 per cent. for interest, repairs, &c. The day's work

being $8\frac{1}{2}$ acres, the sum per acre would be 4s. 8 $\frac{1}{2}$ d. for the operations of the last 36 days.

In conclusion, I will just comment a little on the character of the tillage which I inspected.

A twenty-acre field, with waving high-backed lands, with a gentle dip to the brook, "used to be swum after a heavy rain," even after it was drained. Now that it has been broken up 11 inches deep, the water passes right through to the drains, and, when I saw it, it lay in a beautiful condition for the autumnal influence. Not a living weed to be seen. A twenty-five acre field, broken up 11 inches deep, after tares, at twice, a fine operation—dead weeds in plenty, but no living ones. Fourteen acres after wheat, grubbed 9 inches deep in $2\frac{1}{2}$ days, for beans, would not have been so treated but for steam. Eleven acres dug when the land was baked so hard that no horse would have touched it, 9 inches deep, in 3 days. The great dock-roots with which the piece was infested lay unearthed on the surface, thoroughly rotted, in a beautiful state, intended for barley. Twenty-one acres, similarly infested with crowfoot, which, after twice grubbing, now lies withered on the surface of the great clods, as helpless as the docks and couch grass which accompany it. The inevitable result in all these cases must be increased produce.

A 50-acre piece, similarly treated, displayed the great couch roots, two or three feet in length without a break, and quite dead. I ventured to suggest to Mr. Watts that he should secure a few specimens of this weed for his museum before it was quite eradicated. Surely, the news of these doings must have had some effect in prevailing upon those who started to manufacture paper from couch grass, at or near Stamford, to abandon the enterprise, since their raw material bade fair to run short. This 50 acres, grubbed from eight to nine inches, took eight days, inclusive of all movings, &c. The whole of the cultivation—I saw no ploughing done by steam—was most efficiently executed. Mr. Watts does not play with his apparatus. One or two operations at most, well directed, is all that is usually required. It is well to know when to stop, and let Nature complete what Man has commenced. This is the secret of successfully dealing with land.

There is a great point made by those who oppose steam culture, of the difficulties which must arise in harvest-time, where the stock of horses is reduced. Mr. Watts does not find this to be the case. He has parted with nine, and with the twelve that are left, harnessed to as many Scotch carts, is able to get his corn together in less time than his neighbours; for instead, like them, of carrying it to the homestead in two-horse waggons, when wages are high and time is quintupled in value, he stacks the grain about the fields, and moves it as it is wanted to the thrashing-machine, when labour is cheap and time of less value.

F. R. S.

THE GRAIN TRADE IN SOUTHERN RUSSIA.

Little attention has hitherto been given in Southern Russia to improvement in the culture of land, although the strength and fertility of the soil are indisputable. Under the present dislocated social state of Russia, however, no immediate impulse in this direction can be looked for. The main difficulty to contend with is the droughts to which the country is subject—an evil not to be altogether overcome by the appliances of art. Agricultural implements and machinery are growing into favour, and more particularly such as are of simple inexpensive construction. Those requiring steam power are also in some

request, but mechanical knowledge and superintendence, with a costly combustible, being necessary to work them, they are in use only on large estates and by wealthy proprietors.

The Azoff, more especially Taganrog, from its position, and the command of a wide extent of territory, promises to become the largest exporting port for grain, seeds, and low quality wool of any in Europe, if not of the world. The lower descriptions of cereals, viz., rye and barley, have now gained, as well as wheat, an important footing. The shipments from Taganrog last year computed

158,000 qrs. of rye, and 131,000 qrs. of barley, 350,000 qrs. of oil-seeds, and the average export of wool is from 4,500,000 lbs. to 5,500,000 lbs. annually.

Wheat is now the principal production, consisting of two kinds—hard wheat grown either on virgin land, or such as may have lain fallow for several years. This grain, sown in the spring, is of large size, has a pale yellow glossy appearance, and weighs from 60 to 65 lbs. per bushel. A yield of ten grains to one of seed is considered moderate—twelve to fifteen for one, good. It is very susceptible of injury from moisture shortly before maturity and soon after being cut. The finer qualities are taken principally for Italy, and worked up into macaroni, vermicelli, and other similar pastes. Turkey and the Archipelago are the best customers for secondary sorts. The quantity of this hard wheat shipped is about one-fourth the total exports.

Ghirka, or soft wheat, is a small plump grain. The best kind is of a lively orange colour—the more ordinary approaches nearer that of coffee in colour; its usual weight is from 58 to 60 lbs. the bushel, the yield from ten to fourteen for one. It is sown in spring. In the neighbourhood of Taganrog the cultivation of hard wheat is preferred: Ghirka is mostly grown inland. The principal supplies come from more remote districts, and from the governments of Varonege and Saratoff. Good quality Ghirka is held in high estimation in England, hence the principal shipments are destined for British markets. The shipments of wheat in the years 1861 and 1862 averaged 1,276,000 quarters. A great deal, observes our consul-general at Odessa, has been said, both in Russia and foreign countries, for some years past, concerning the supposed decay of the corn trade at Odessa, and a very general opinion has existed, even among the local inhabitants themselves, that their trade was exposed to peculiar disadvantages by the railways made recently in Austria and Hungary, while railways were wanting altogether in Russia. It is doubtful, however, whether mature experience and consideration at all justify the very serious apprehensions which have been so long felt on this subject.

Those who know anything of the corn trade are aware that the transport of grain by railways is very costly, and can never be practised on a large scale. Austria and Hungary will therefore never be able to interfere seriously with the corn trade of Southern Russia, except during years of great scarcity in France and England, when prices may be high enough for a short time to bear the expense of railway carriage; but in ordinary years, when average prices rule the markets, the merchants of Marseilles and London will always send their orders to Southern Russia, in preference to Hungary. The price of wheat in Odessa last year was, in some cases, as low as 88s., and never exceeded 48s. per qr. It is obvious that so long as Southern Russia can furnish grain as cheaply as this, there is not likely to occur any diminution of the trade with Great Britain. The average shipments of wheat for the last four years from Odessa have been about one million quarters.

If the Russian government would employ about £300,000, as it probably will do shortly, in rendering the Dniester perfectly navigable from Khoten to the mouth of the river, iron barges, each containing from 1,000 to 1,500 tchetverts, might bring down yearly to Odessa nearly two million quarters of grain from Podolia and Bessarabia, at an expense of about 2s. to 2s. 6d. per qr., as the average price of transport. Southern Russia would then be able to compete successfully not only with Hungary, but even with America, which has hitherto been a far more dangerous rival, owing to the facilities afforded by the rivers and canals for the transport of corn in that

country. The corn trade can never increase as much as it might do, and ought to do, in countries where the transport is made by railway. The expense of railway carriage can only be borne by merchandize of great value or for small distances; but for an article which takes up so much room, and which bears so low a price as corn, water is the sole means of transport worthy of serious consideration; and Southern Russia fortunately possesses rivers which may be easily rendered navigable for iron barges, at small cost, and in a very short time. It is to be remarked, with reference to the supposed competition of Hungary, that Odessa has been sending corn to Trieste and Fiume, which appears to show that such a competition is altogether imaginary.

The fact which has probably interfered a good deal with the increase of the Odessa corn trade during the last few years has probably been the immense change which has taken place in the state of Russia during that time. The establishment of the telegraph and the emancipation of the serfs have both influenced it materially. Ten years ago the merchants of Odessa were often able to realize 15s. per quarter upon their exports of corn to foreign countries. The absence of telegraphic communication with the rest of Europe often gave the wealthier merchants exclusive sources of information, and they were thus able to dictate their own terms to the producer. On the other hand, the owners of estates grew their corn by serf labour, without any actual expenditure of money either for work or machinery. Now these large profits can no longer be realized. The serfs are free, and the landowners are obliged to pay for labour, and to find capital for agricultural machinery, to save themselves from ruin. To these considerations must be added those which arise from the American war, which has prevented the Northern States from sending corn to the South, and thrown an enormous surplus on the European markets.

In the list of arrivals at Marseilles, the imports from Southern Russia always keep their place at the top. First stands Odessa; then the ports of the Azoff; then those of Galatz, Ibraila, Alexandria, and Roumelia. Little is said of any imports from Hungary. It is just the same in the North of Italy, which consumes wheat chiefly from Russia and the Danubian principalities. Surely the merchants of Genoa and Leghorn understand their business too well not to address their orders to Hungary instead of to Odessa, if Hungary could supply them on better conditions.

In England very little corn arrives from Trieste in comparison with the enormous importations from America in average years; and, although occasionally the high prices which might be paid in France and England would give Hungarian produce a momentary place in the market, yet it is quite clear she never can compete with Southern Russia except during periods of unusual scarcity or in time of war. The advantage which Southern Russia maintains over Hungary, and is likely to maintain, are easily explained. The course of the Theiss from Tokay to the Danube, and of the Save from Semlin to Siseck, and again from Siseck to Trieste by railway, is nearly 800 English miles; whilst the course of the Dniester and the transit by sea from Khoten, on the extreme frontier, to Odessa, does not exceed 400 English miles; and the districts which send most grain to Odessa, such as Mohylaw, Jampol, Soroki, &c., are scarcely at a distance of 800 miles from Odessa, so that the cost of transit will naturally bear no comparison.

Hungary, indeed, has always been a large corn-growing country, and in times of scarcity her produce may be attracted by high prices to the great European markets. But in ordinary years her produce will be consumed by Austria, Silesia, and Saxony, where Southern Russia can never offer to compete with her.

THE FUTURE PROSPECTS OF THE PLOUGH.

In a previous article we took a retrospective view of the past history of the plough as to mechanism and efficiency in the field, and the general conclusion arrived at was that there is, after all that has been done, still left plenty of room for improvement. The proposition of a rectangular furrow-slice, and the squeezing problem of the mould-board or turnover, were weighed in the balance and found wanting. The origin of both is but of very recent date. Looking backwards, the agricultural world has gone on longer without than with them; and if such is the history of the past, inquiry naturally turns to the opposite view to ascertain what the future will say on the subject, now that the steam-horse is fairly started in the field.

Our object is to discuss the progress of sound principles—mechanical, chemical, and physiological—without expressing a single opinion about this body's or that body's steam plough. Sound principles are things, *per se*, that will triumph in the long run, however popular the contrary may be for a time and apparently successful in practice; but they are subtle things, and, like all such, require sharp looking after, to turn them to the best advantage. "To err is human," even in the case of self-interest; and therefore the more successful we are in any enterprise, just so much the more need is there for circumspection.

The mechanical questions involved in the inquiry have reference to the construction of the plough, its mode of action, and the mechanical state in which it leaves the soil for the chemical and physiological propositions.

The chemical inquiry embraces all questions connected with the fertility of the land, as the economy of manure considered as the food of the peculiar plants cultivated.

Vegetable physiology has more to do with the plough than some may imagine. In point of fact this is the broadest of the three fields thus opened for discussion, as the sequel will show; for if cultivated crops do not grow, weeds of some kind or other will luxuriate.

It is not our intention to say much about the details of the mechanism of the plough of the future, or the shape of the furrow-slice and angle at which it will be laid by our grandchildren. From time immemorial practical agriculturists have been familiar with the fact that the more shapeless the furrow-slice the heavier the crop in harvest, provided it has a roundness and roughness about it—mechanical characteristics that are not very easily described, but which will readily be understood by our professional readers familiar with them in the field. One ploughman, for example, goes whistling along at a happy pace, leaving "a round, rough, rattling furrow-slice" of this kind behind him, as if he and the implement, his team, and the land itself, were all four on the most friendly terms. It comes natural to them, and they enjoy it as a family affair. Another fights a pitched battle from morning to night, the very ground itself being against him; and all this bustling ado to cut a rectangular furrow-slice and squeeze it up at the proper angle! A third, a "greenhorn," a beginner in his teens—young Harry himself—is at it with all his might, sometimes at the trot, sometimes at the "snail gallop," and as often at a "stand-still" as either; the furrow-slice at one time flying over on the top of the ploughed land, and at the other grinning behind him, or else rolling back into the open furrow, grassy side uppermost. In vain his father shouts to "take it easy" or "go steady," for as yet he knows nothing about the mechanical philosophy of the normal velocity of a good-going plough. The plough and the horses are, of course, to blame for the

bad work thus made, and not he. Such are the differences that are daily to be seen exemplified in the field, although all the ploughs are identically the same as to mechanism, and the teams upon a perfect footing of equality as to might and mettle.

Practically, the differences of this kind are easily accounted for, by those who understand them. Fields of growing corn and broad meadows covered with cattle may intervene; but, so long as the three teams are seen, the one ploughman is readily distinguished from the other by the eye of the farmer who has been taught to hold the plough, and is himself thoroughly master of this branch of his profession.

The art of ploughing hinges upon the mechanical questions of velocity and balance of the plough. To make good work, there is a given velocity at which the team must be driven, and a uniform minimum amount of power applied to the handles to counterbalance certain differences between the traction force and the resistance, arising from peculiarities of soil that cannot be otherwise reduced to a state of equilibrium; and that velocity and this power must go in harmony together before success can be attained. Books may teach certain rules as to breadths and depths of the furrow-slice and the stereotyped angle of 45 degrees at which it should be laid; but all who have walked and can walk at pleasure successfully between "the stils" or plough-handles know from experience that this is "fireside routine," and not sound practice. No doubt the rule of a rectangular furrow-slice may be sound, when only applied to the "landside" of the question; but this, it must be borne in remembrance by the reader, is only the left-hand side, for when we turn to the other side—viz., the right-hand side or turn-furrow and furrow-slice side, then the rectangular theory is oftener the exception than the rule, and, in point of fact, ought never to be so. In other words, this rectangular theory, which has now been taught for half a century, is a "fireside" mistake—a misapplication of mechanical principles—and, what is worse, the very reverse of what should be taught, as the next paragraph will prove.

According to the practice of the first or most successful ploughman, the rectangular sod is turned into a circular one; and as this form of the furrow-slice is that which produces the best crop, and maintains the highest degree of fertility in the land, it follows that *the conversion of the square into the circle* is the true rule that should be taught for the future.

Like all other professional questions of art that hinge upon specific detail, requiring to be closely examined before they are practically understood, so the mechanical *modus operandi* of the three ploughmen, with their ploughs and teams, demand a close matter-of-fact investigation in the field, in order to comprehend the *rationale* of converting a rectangular sod into a circular one, under all the circumstances of the case, as to diversity of soil and season.

On turning to the best ploughman, the first thing that arrests attention is the great ease and freedom at which he and his horses walk, when compared with either of the other two examples. Between the head and hands, feet and elbows of the former, and between the heads and shoulders and feet and back-bones of the latter, there appears to be a close reciprocity of movement; and when we follow up the mechanical inquiry into their respective details of action, we find that this mutual relation is essentially necessary to the economy of power applied in

handling and holding the plough, and to the successful inversion of the furrow-slice, so as to solve the problem of transforming the square into the circle. To the superficial observer, who has never given the subject a moment's mechanical consideration, there may not appear any perceptible difference in the angularity of the ploughman's elbow. In this, however, there is an oversight, for half the secrets of his success depends upon the use he makes of his elbows; and when we examine their mechanical function, relative to the *modus operandi* by which power is applied to the handles in holding the implement, the rationale of the secret becomes manifest, for the plough-handles are kept at a uniform distance from the ground, whereas the body of the ploughman does not move in a straight line, there being a gentle departure from it horizontally and vertically; and the elbow is the principal articulation or joint whereby the balance is restored to a state of equilibrium, so as to preserve the natural dignity of human progression, and to secure the greater economy of muscular power. The greater ease with which his horses move is accounted for in a similar manner.

In the second example there is a manifest departure from the natural type of things, both in the case of the ploughman and his team. Rigid elbows and shoulders, for example, and twisting of backbones, is now the practical rule. The horses neither walk so uniformly and steadily, nor pull at so even an angle, as in the preceding example. Somehow or other, they do not like it—a fact that can easily be seen, but only to be accounted for by a sort of sympathetic relation existing between them and their drivers, combined with a dread that all the bad work would be attributed to them, and none of the good. They feel, or seem to feel, sensible that he is fighting a hard battle, and that all is not right, consequently they take it accordingly; while they are unable to comprehend, beyond the daily routine of brute experience, why they should be placed in a predicament so opposed to the natural order of things. Hence, their stiffness of demeanour, and greater liability to break out into perspiration in close weather.

Of the third example, until the young farmer is fairly colted and broken in, it would hardly be fair to say anything special about "elbow grease," or the peculiar movements of the lumbar region and inferior extremities. We quote the example, to show the effect of a greater or less velocity in the turning of the furrow-slice, in contrast with the uniform and well-timed pace of the first example.

Turning from the ploughmen and their teams to their ploughs, and the quality of the work performed, we find, in the case of the first example, a less amount of tear and wear of the working parts of his plough, as compared with the second and third. This arises from the greater amount of adverse force applied by the latter two ploughmen to the handles of their ploughs, such forming levers of the first or second kind, according as they are actuated. If they (the ploughmen) are sometimes passing to the left hand, sometimes to the right, at other times lifting up, and the next pressing down, then all these forces are antagonistic to the tractive force of the team, and to the rectilinear progression of the implement; consequently, they must less or more increase the amount of tear and wear. In the expressive language of practice, the first ploughman's plough "*goes of itself*." In other words, it will go for a short distance alone, moving smoothly upon its own bottom in the furrow, the ploughman's hands being both withdrawn. Under such circumstances the adverse forces on the wedge are in what may be termed a normal state of equilibrium—a minimum amount of power being applied by the ploughman.

The plough, by going evenly on its bottom, or, technically speaking, by "*soleing freely*," cuts the furrow-slice perpendicularly on the land side, and level or evenly in

the bottom. The sod removed from the unploughed land is thus a rectangle. It is so from headland to headland more uniformly than in either of the other examples.

We now come to the climax of the problem, viz., the transformation of the rectangular sod into a circular one; so that, "when the ridge is finished, the furrow-slices *lie* like fine fat herrings back to back on a plate." So we have heard the comparison made by more than one sound sensible practical farmer. In short, how does the metamorphosis of the rectangular sod take place?

The process requires to be seen to be practically understood, but the following will suffice for a general idea: By well breaking and frittering the furrow-slice on the under-side, it naturally, as it were, assumes a certain degree of concavity above. Now, what is this loosening of the sod on the one side, but a change of position to the particles of soil, which splits into shapeless laminated fragments, that range themselves or are ranged from the concave side upwards, like the radii of a circle, and thus forming the well-known round furrow-slice, "the fine fat herrings" in the above allegory! It is done partly by the curvature of the mould board, partly by the greater transverse velocity of the upper edge of the sod than the lower, but principally by the proper rectilinear velocity of the implement. This latter conclusion is manifest from the fact that the former two, as to curvature of the mould-board, and difference of transverse velocity, are common to all three ploughs, but the first only rounds the sod; and the theory appears to be as simple as the practice is effective and profitable.

The questions of profit resulting from the loosened and well-broken furrow-slice, and the loss arising from squeezing and consolidation, belong to the chemical and physiological divisions of our subject, and will under them be discussed. We shall conclude our mechanical notice by the application of what has been said to the steam-plough.

The relation between the velocity of the wire-rope and the curvature of the mould-board of the steam-plough is already beginning to speak for itself with the tongue of Practice in the harvest-field. Although we cannot say that the rectangle has been yet altogether transformed into the circle, two things nevertheless are manifest, viz., that the sods are getting a regular good shaking and breaking; and that, eventually, the steam-plough will beat its old rival on the question of velocity and frittering the sods into the form of fine fat herrings.

The next inquiry will be principally of a chemical character. Our previous observations were almost exclusively confined to the construction of the plough—past, present, and future; and to the form of the furrow-slice. But, the peculiar mechanism of the latter, the round sod that produces the best crop in harvest, involves chemical questions that require solution, because it is upon them the difference of fertility most depends. The best crop also hinges upon physiological data inseparable from the chemical, but in prosecuting the subject it will be advisable first to examine it from a chemical point of view. A knowledge of the latter is necessary to the successful investigation of the former.

In the form of an interrogatory, the question may be practically put thus—How is it that the round, ragged, shapeless furrow-slice produces a better crop than the finely-formed rectangular one? How is the fact to be accounted for that the squeezed sod is less fertile than the one whose appearance is less promising, in the estimation of amateurs, whose knowledge is more confined to book routine than the results of seed time and harvest? And since the fertility of the land is more a chemical than a mechanical question, how, again, on the other hand, do we account for the opposite result—that the sod which gets the greatest amount of shaking, breaking, frittering, and

mechanical tending, yields the largest amount of the best quality of corn? In fine, as two questions are obviously involved, and therefore raised for solution, viz., a chemical proposition and a mechanical one, what is the peculiar relation that exists between them?

The practical solution of the above opens a broad field for discussion. That the atmosphere has something special to do in the matter has long been a popular conclusion amongst agriculturists; but this rather extends the view than otherwise, thereby placing the object sought at a greater distance, whereas we want it brought nearer. Too much atmosphere is just as bad as too little, if not worse. The drifting sands of central Africa and of Arabia are practical illustrations of this extreme. So are many of the once fertile plains of a large extent of Asia, the cradle of our race. Such examples naturally suggest moisture, as having an active part to play in the fertilization of the land. "The clouds drop fatness," is an old inspired credence; but when we examine the round sod and the rectangular one, the chemical difference is obviously not a hygrometrical one, however essentially necessary the presence of water may be in the fertilizing process. We next come to the old proverb, "*Muck's the mother of meal*," and here we find that both furrow-slices (the round and the rectangle) stand upon a footing of equality as to the amount of supply of manurial element, animal, vegetable, and mineral, which they respectively contain. The solution of the question does not therefore hinge on air, water, or manure. These are only chemical members apart as it were from the mechanical, but the relation somehow or other must of necessity embrace both, so as to connect the mechanical and chemical questions together. In other words, rectangular sods and round sods are not chemical questions.

We must, therefore, begin at the mechanical end of the relation, in order to reach the key to the solution of the chemical one. And on the threshold of the inquiry it must be borne in mind that it is neither the rectangular furrow-slice nor the round one upon which the foundation rests, but the difference between them, for Chemistry will fraternize as readily with a rectangle as with a circle. In point of fact, as the sequel will show, she rather prefers the keen edge of the acute angle to the fellowship of either, and in this lies much of her secret.

Are we to infer from this concluding observation that the *grand secret* of the ploughman's art lies in fissuring and frittering the sods so as to catch the air, the water, and the manure in the infinite number of acute angles thus formed, and there and then, by a sort of galvanoelectrifying action produced by the plough-irons and mould-board moving at the given velocity, to start the laboring apparatus of Nature into full play in fertilizing the land? At all events there is something in this, were it properly expressed in the language of the occasion, that embodies much of the mind of many practical farmers on the subject; for unquestionably the fertilizing process begins, the moment the round sods are turned up to the weather.

If this is the whereabouts of the fertilizing secret, the keen razor-edged acute-angles of the round furrow-slice require to be closely looked into. Take them up and smell them (the finely frittered sods), and the olfactory-nerves do indicate a sort of sulphurous catalysis. "It aint exactly sulphur," but a gaseous compound; and if it is true that the formation of ammonia requires the presence of such a compound, it may serve as a clue to guide us safely a little farther into the unknown labyrinths of the natural laboratory.

Let the above fertilizing hypothesis be right or wrong, one thing is certain—that the nose is the farmer's best analyst, so far as gone, and that whenever smells of this or any other kind are discovered, they should at once be

laid hold on, as a species of property that requires sharply looking after, before they can be turned to profitable account.

It is when the land is ploughed "between the wet and the dry" that the rounded furrow-slice is most successfully formed and the greatest fertilizing effect produced. May not this old-established and familiar rule farther assist us in the discovery of chemical truth, as exemplified in the natural laboratory of the soil? It certainly may, and in following up the inquiry in this direction let us also examine the two extremes—the land when too dry and too wet, under both systems of ploughing, including their harvest results.

When the land is between the wet and the dry, the two systems of ploughing are more nearly upon a footing of equality, than when the staple either contains an excess or deficiency of moisture, especially the former, as during the winter months.

In this general conclusion there are three separate and distinct questions that demand solution, viz., Why is the rectangular furrow-slice most successful between the wet and the dry? and, *vice versa*, least successful when the land contains a large per-centage of moisture? and thirdly, Why does the round sod fall behind in point of extra merit in dry weather?

These are practical questions that are easily solved by farmers in the field in a general way. Thus experience has taught them the value of certain appearances, and these they readily recognise and appreciate. But what they perceive belongs principally to the mechanical side of the subject, for when chemical differences are enumerated the proof is always left for the harvest to supply. With practical men the bushel determines the relation between seed time and harvest. This, however, is not the solution we require; and when we enter upon the details of the question why the rectangular and round sods thus beat a head or fall behind in the race, it requires a keen eye and a clear head to determine differences; but granting the force of this, it is nevertheless manifest that there are turning points in the contest, and that such must necessarily be observable to the chemical eye, if not to the microscope. In other words, what farmers cannot perceive with the naked eye, or by the aid of the microscope, they may be able to determine by the chemical sense of smell.

When the land is between the wet and the dry, and when the ploughs move at equal velocities, the rectangular furrow-slice is more fractured and broken, consequently it approaches more nearly to the mechanical condition of the round one.

When the land contains a larger per-centage of moisture, as it generally does during the winter months, the principal breadth for crop being then ploughed, the action of the plough-irons and the squeezing of the mould-board compresses the rectangular sod, so that unless this is counteracted by the frost the result is unfavourable; and the more slowly the horses move the greater is the amount of harm done by the squeezing and consolidating action of the mould-board, plough-irons, landside, and sole of the plough.

When the land contains a deficiency of moisture, as during summer, or drought in dry springs, clayey soils "board" or break up into large pieces, while friable ones are too much aerated; and the faster the plough moves the more unfavourable are results. In other words, the round-furrow system is less perfectly carried out, its details thereby approaching more nearly to those of the rectangular system. This conclusion is equally, if not more applicable to autumn cultivation; although the details are otherwise widely different, the winter frosts reducing both systems to a state of comparative equality, whereas in the former season the absence of moisture, and not heat, is the principal equalizing cause.

Such are the mechanical differences in the three cases, and the more closely we examine their several details and the relations that exist between them and the chemical effects produced, the more evident does the above conclusion appear relative to some sort of galvanic electric action in the decomposition of the atmosphere, conjointly along with that of the animal, vegetable, mineral, and gaseous matters of the soil, in the process of its fertilization, or in supplying in the most favourable manner food to certain cultivated plants. In other words, the chemico-mechanical relation is strongest when air, moisture, and manure are present in the soil in the proper proportions, when the particles of the staple are sufficiently bound together, as they are "between the wet and dry," to require a slight force to pull them asunder, or break the rectangular furrow sods into minute laminated fragments so as to reduce the square into the circle, and when all this is done by the plough moving at a certain velocity freely on its sole with a minimum degree of squeezing action of the mould-board. The fertilizing effect produced is thus of a very complex nature, and so is its cause; for if a single member is wanting, or in the slightest degree modified, results in harvest-time are different.

Of modifications of this kind, the most interesting is that involved in the velocity of the plough; for when the team walks below the proper speed due to the peculiar nature of the soil, the chemico-mechanical relation is weakened, and consequently a less fertilizing effect is produced.

It would thus appear, superficially examined, that the furrow-slice must be broken by a certain force before the greatest fertilizing effect can be produced. This brings us to the inquiry—is such really the case? If it is so, it speaks volumes in favour of the steam-plough. We know that when a sod between the wet and dry is cut in two by a sharp spade, and the fresh surfaces examined, little or no smell is perceptible, and if it is pulled asunder slowly between the hands, the impression on the sensorium

is hardly felt; if quickly broken the smell is greater; and greatest when the clod is broken by the stroke of a hammer or wooden mallet, and the fissures kept comparatively close together in the hand. And we are also familiar with the fact that the quality of the smells is different from clods obtained from different geological formations.

All this lies in the same direction of evidence as the preceding; and the next question that arises for solution has reference to the cause of these smells and their manurial values. Are we to attribute the amount and quality of the gases, for example, to the manner they are liberated? or to the percussive stroke of the mallet, and the narrowness of the interstices which confine them (the gases), thereby applying them in a more concentrated, and hence perceptible, form to the organs of smell; or, what is more likely to be the case than either, viz., to the joint agency of both.

There cannot be a doubt but that percussion rouses into action both latent heat and electricity in this as it does in many similar examples; that when such is confined within the narrow fissures of the soil, with a sufficiency of moisture and natural heat, it is favourable to the fertilizing process, as the nitrogen of the atmosphere under such circumstances may be utilized, and that chemical changes of this kind take place at a much lower temperature than is generally credited. It is equally manifest, and, indeed, susceptible of practical proof, that the peculiar fracture of the round furrow-slice exercises a powerful efficacy in preventing the soil "running together" in wet weather. In this it in some measure resembles the surface soil when thoroughly disintegrated by the frost, which afterwards will stand up under any amount of rain and sunshine, without running together by the one, and baking under the scorching effects of the other. In the expressive language of practice, the round sod takes on the weather better than the rectangular one, and the above data lead to the conclusion that this is as much due to chemical as mechanical laws.

ENGINEER.

THE EMPLOYMENT OF LINSEEDCAKE IN FATTENING CATTLE.

The employment of linseedcake in fattening cattle is increasing in the United Kingdom, but not to the extent that might be expected, considering the large increase in the consumption and production of animal food. The excellent effect its use, when pure, has upon animals of all kinds, as an auxiliary to the ordinary articles of food, might lead one to suppose that the demand for it would be greater, especially when the price of inferior cereals, such as barley, beans, and peas, is high, as it has been the last few years. We may perhaps find the reason in the fact that a large proportion of the foreign linseedcake is adulterated—not generally by design, but by the careless manner in which extraneous matters are allowed to remain in the seed when crushed.

Upon an examination of the returns of the Board of Trade, we find that the average annual importation of oilcake of all kinds amounts in round numbers to 98,000 tons, taking the last eight years from 1855 inclusive; and that of linseed for the same period, 198,000 tons, or about 1,086,154 quarters of eight bushels each. The quantity of both fluctuates very much, according to the crop of linseed abroad, which is rather a precarious one. The loss in extracting the oil is estimated by Professor Anderson, of Edinburgh, at 25 per cent. This will give 148,500 tons of linseed cake; and if we reckon that half

the cake imported is linseed cake, by adding it to the above, we obtain the following account:

	Tons.
English-made cake . . .	148,500
Imported ditto . . .	46,500
Total . . .	195,000

The value of this at £9 10s. per ton is £1,762,500, of which by far the largest part is paid to the foreign growers.

The extraneous substances found in the foreign linseed cake are various, as sand, grass seeds, a black round seed of the species *polygonum*, which latter, though not poisonous, is indigestible, and, as well as the sand, causes irritation of the stomach, and consequently interrupts nutrition. Mustardseed also is sometimes mixed, which is still more irritating to the system of the animals that eat it. In one sample analyzed by Professor Anderson double the usual quantity of water was found and a large amount of extraneous seeds, making altogether from 30 to 40 per cent. of adulteration; and it was plain, from the little adhesion the cake possessed, that the original cake had been broken up, and the extraneous seeds and the water added.

As to the deleterious or poisonous character of these

mixtures, the Professor considers it extremely difficult to detect organic poisons in the stomachs of those animals which take them; and he is inclined to think that the cases of deaths of cattle alleged to have been caused by eating oilcake with poisonous seeds in them, are not confirmed by scientific evidence. At the same time he cautions the farmers against purchasing adulterated cake, as containing a much less proportion of nutritive matter than genuine cake.

In using crushed linseed instead of cake, the farmer can avoid adulteration if he sees that the extraneous matters are taken from it. English grown seed is free from them, but foreign can seldom be procured pure. If the farmer crushes it himself, which is certainly the best plan, he can ensure this by dressing it over until nothing is left but the pure seed. The only question is, whether the result will pay for the trouble and expense, and to show this we shall now address ourselves.

On inquiry we find that from every quarter of linseed the crushers extract 11 gallons of oil, besides a large quantity of soluble albumen, this latter amounting to 15 per cent. Both these materials are highly nutritious, and are, of course, lost from the oil-cake. There are 5 qrs. 3 bush. of linseed in a ton; and the quantity of oil in the ton is, therefore, about 58 gallons of 9½ lbs. each, or in weight, 551 lbs., being nearly 25 per cent. Together, then, the oil and albumen amount to 40 per cent. of the linseed; and, when deducted from the 198,000 tons of seed imported, leaves 118,800 tons of cake, the albumen being wholly lost. If we estimate the 58 gallons of oil at 3s. 3d. per gallon, we obtain £8 18s. 6d.; and reckoning the 5 qrs. 3 bush. of linseed at 70s. per qr., it gives £18 14s. 3d.; therefore:—

	£	s.	d.
From 1 ton of linseed	18	14	3
Deduct 58 gallons oil	8	18	6
Cost value of the cake	9	15	7

Linseed-cake, of the best quality, sells at £12 per ton, which gives a profit between the crusher and the farmer of about £2 4s. 5d., or rather more than 16 per cent. And as the farmer can purchase the seed at 70s. per qr., or £18 14s. per ton, with the oil and albumen in it, the question is whether the additional profit will pay him for the trouble and extra expense the use of the crushed seed involves?

Stephens, in his "Book of the Farm," tells us that Mr. Marshall, of Holme Lodge, Bedale, Yorkshire, fattened two lots of beasts, of eight each. To one of these lots he gave two pounds of crushed linseed, five pounds of ground corn, ten pounds of chopped straw, and 85lbs. of yellow bullock turnips per day each bullock, adding a little straw uncut in the rack at night. To the other lot he gave five pounds of linseed cake, and 112lbs. of turnips. The eight bullocks of the two lots cost therefore per day respectively as follows:

	s.	d.
1st. Linseed cake, 3 stone at 1s. 1½d. ...	3	4½
896lbs. of turnips	3	0
Labour	0	5½
	6	10
2nd. Linseed and ground corn	4	4
680lbs. of turnips	1	6
Coals 6d., labour 5½d.	0	11½
	6	9½

The difference here is very small; but the two lots of bullocks were sold at the same time, and those fed on the crushed linseed fetched £2 6s. 6d. cash more than the others.

Warne's work on the subject is well known, and the proofs he brings forward admit of no disputation. In the case stated, two pounds of linseed were pitted against five pounds of cake, and the five pounds of ground corn against the excess of twenty-seven pounds of turnips; to which ought to be added the boiling of the linseed and meal, whilst the turnips in both cases were given in the raw state. The profit, however, was large enough to cover any extra expense or trouble that might be incurred.

"One of the main causes of the rapid progress of cattle when fed on prepared food," says Mr. Thompson, "is, I conceive, the perfect state of health the animals enjoy. Linseed oil is a mild purgative, and when mixed with meals, and especially bean meal, the bowels and skin are kept uniformly in a state of health which, I think, cannot be surpassed, and which I never before saw equalled." Another gentleman, Mr. Hutton, says: "What I have seen of this system convinces me that certainly double the quantity of stock may be maintained with the same quantity of turnips as we consumed on the old plan of feeding cattle. The manure is of the best quality, and very soon fit for use. No manure I have seen has equalled in efficiency that derived from this process. Hence it is hard to fix any precise limits to the number of stock that may be kept and maintained on a farm, where a moderate supply of turnips is raised, where this method is rightly carried out and persevered in."

This question has already occupied the attention of the farmers, and various opinions have been expressed founded on trials. Where these have failed, it may have been owing to the crushed seed not being mixed with meal, and being given in too large quantities may have acted too powerfully on the bowels of the cattle. As used by Mr. Marshall, mixed with bean-meal, which by its astringent property modified the laxative tendency of the oil, the effect was excellent; and unless it can be proved that oil and albumen possess no nutritive properties in cattle feeding, it is just such an effect as might be expected from it. The expense per day is not less than the usual mode of feeding with oil-cake; but the superior quality of the manure added to the extra profit on the cattle gives the linseed a superiority quite decided enough to justify its use.

FARM BUILDINGS.

LABOURERS' COTTAGES ON THE FARM:

The "English cottage" and the "Scotch bothie" continue to form the never-failing periodical topics of discussion. Seed-time and harvest are promised ordinances, and never fail to return at the time appointed; and no sooner is Parliament up, and the stirring echoes of the

sportsman's gun are abroad in our valleys, than the humble habitations of our peasantry form the interseasonal commentary of the season. If it is "Old England" this time, it will be "Auld Scotland" the next, and so the rustic homily runs, while the fifty thousand Irish cabins that send us their annual crop of measly pigs are always

sure to come in for their own share of "fair-play" by way of chorus.

That labourers' cottages are out of date, generally speaking, is a truism that may be sung with as much fidelity in our day as it was when the poet Burns wrote his "*Cottar's Saturday Night*," or Tusser his "Five Hundred Points in Husbandry," or Virgil his "Georgics;" and that the same complaint may be made to the end of time with as much truth, is a conclusion which anybody may affirm without fear of contradiction from the historical records of the future. Those who pay their tailor's bills quarterly may keep themselves in the fashion, but it is otherwise with the owners of household property, for there is a wide difference between the broad-cloth on the one hand and the bricks and mortar on the other. Thus, if Princes pride themselves in the palaces of their ancestors—the older, the more esteemed and revered, point with solemn pathos to trees planted long ago by sacred hands in commemoration of some eventful period in the family history, and even weep when the pitiless storm lays the "old pollard" in the hedge, or a "Herne's oak" in the forest prostrate on the ground—what are we to look for, in the humbler walks of life, where self-interest backs with greater sincerity the sacred solemnity of the occasion? The fruit-tree, the woodbine, and the ivy daily bring home to the heart of many a cottager and humble owner of a small cottage or two the sacred associations of the past, in a manner that requires to be personally felt to be thoroughly appreciated. There are thousands of cottages, doubtless a long way out of date as to the domestic accommodation which they afford to a large family, cottages which many admirers of rural scenery as well as landowners and occupiers would grieve to see pulled down and rebuilt in modern style! Time has held them up for a century past as honourable *mementos* of Old England's greatness, and, if possible, will do so for a century to come!

It is not to be inferred from the last paragraph that we belong to that section of the antiquarian community who offer the daily sacrifice of idol-worship to every moss-covered stone, ivy-clad wall, or "Herne's oak" to which Shakespear sung with ghost-haunted praises in his "*Merry Wives of Windsor*," that falls in the way. When in the service of a late noble Duke, we were strongly suspected of the contrary; and we confess, if any change has taken place in our respect for the antique, since then it is in the go-ahead direction. What we wish to point out is the difficulty which landowners experience in keeping pace with the times as regards their own mansions, farm-buildings, cottages, and other houses upon their estates. That the castle, the farm-house, the country cottage, and half the houses in the village, are all of them out of date as to the domestic accommodation which they afford to the present age, may readily be granted by the owners and occupiers of the respective premises, perhaps in the majority of cases; but those who annually raise the brick-and-mortar clamour of build, build, build! in accordance with the counsel and style of to-day, appear sadly to overlook the more solemn demands of to-morrow! for the subject is a far more comprehensive one than such generally appear to imagine.

For upwards of thirty years we have advocated strongly improved farm homesteads and labourers' cottages, as also a thorough architectural reformation in towns and villages. Our professional engagements have extended to a wider sphere of action than is the general experience of agriculturists, being practically familiar with the English cottage, the Scotch bothie, and the Irish cabin. We have had ample opportunity, and have not failed to examine the several systems thoroughly, from a physiological, dietetic, industrial, and pecuniary point of view, in each case more as a practical question than a purely scientific

one, but in all to determine the mutual relation between cause and effect.

The general conclusion at which we arrived long ago, and from which we have never seen an occasion to depart, is briefly this. Bad families make bad houses; alike in the castle, the farm-house, cottage, manufactory, or mart; but bad houses seldom or ever make bad families. Bad immoral families will even prefer a bad house to a good one; sometimes, because the former can be had for less rent, but as often for the bad locality and its associations. As Divines often tell us truthfully in their sermons, by way of allegory, "sinners would be miserable in heaven," so it may be said of cottagers of depraved habits; for, take them out of the village, and place them at the homestead under the whip hand of an austere but Christian master, and they, too, would feel miserable, and would either forfeit their privilege, or abruptly leave it at or before the first term day. Houses grow old in the course of time. In this there is nothing either unreasonable or unnatural. The contrary would be so. We have seen houses that had grown old, and even uninhabitable over the heads of agricultural labourers, for whose ancestors they had been built. And more than this; for we have seen the old people shed tears when helping to pull down the humble cottage in the lane in which they had daily surrounded the family altar, and in which they had joined their fathers and grandfathers in singing EMMANUEL'S praise—a cottage scene which Burns very graphically describes in his "*Cottar's Saturday Night*." But so long as the family altar is kept alive, and the other duties of Christian life attended to, the age and growing frailty of the cottage rather add to the sacred solemnity of the occasion than otherwise. And this is equally true of examples in the crowded village as of those in the greater retirement of the farm homestead.

On the other hand, Christian cottagers are not insensible to the decencies of civilized life. However illiterate in other respects they may be, when once they become thoroughly acquainted with their bibles, and are, in short, "*Christians in word and deed*," they exert themselves to get their families into service as they grow up and become too crowded; and, if their boys and girls promise to be like themselves, they are generally inquired after, before they are of age to leave their parents' roof. If a decent cottager has to leave his cottage, or if he is entering upon married life, and by mishap gets a bad cottage, he will look out for a better, and leave it at the first term day, and sometimes sooner. Thus, we have known a cottager rent a cottage of a farmer who represented it as "a good new house recently built;" and so it was, in point of fact, in the latter respect, a new house recently built by the farmer himself, but in a style out of date; consequently, when the cottager came to take possession he refused to become the occupant, or enter into service, and immediately entered into the employment of another, who gave him a cottage more suitable to his family requirements.

In a case of this kind, we may add, our opinion was, a few years ago, professionally taken as to whether the cottager or the farmer was right, and our award was against the cottage, both on sanitary and physiological grounds. It was possible to drain the house and garden thoroughly, but the supply of air and light inside the former were insufficient for the requirements of the family, whose number was honestly and plainly specified by the ploughman in his proposal for an agreement.

A good hand, if a god-fearing man, and having a pious frugal wife and family, will never want a comfortable cottage long.

The rule is applicable to every corner of the kingdom, the sister-country not excepted. As in the case of a good sound, useful horse or cow, and which finds half-a-dozen honest purchasers in a market, while the bad one is only

inquired after by the tag-rag and hap-hazard dealers, who only look at the pecuniary side of the question, so it is with the honest cottager; for the moment it is known that he is about to change his cottage, a choice will soon be given him of half-a-dozen, and sometimes double that number.

In such a case a Christian cottager will prefer a God-fearing master, and the worst of two cottages. We have frequently been an eye-witness to this, and have on several occasions been consulted privately as to whether the cottager could consistently, in a religious sense, enter into the services of such and such a master. To cultivate the moral and religious elevation of the labouring classes is no less the bounden duty of every employer, in a moral and religious sense, than it is his profit in a professional; and to those who thus extend the honest hand of Christian fellowship there is something of a very heartfelt, stirring nature, in giving the toil-worn labouring man the necessary advice which he in confidence asks in the name of "a brother." And it is gratifying to add our conviction that we believe this "bond of brotherhood" is growing stronger in every province and amongst all religious sects.

We have said bad characters occupy bad houses, and even prefer them, and that the Christian cottager will prefer the worst of two houses under certain moral and religious conditions. The practical conclusions that follow are doubly interesting; for the honest industrious man often so improves his cottage as to give it a totally different appearance, both internally and externally; and the same is true of the garden, piggery, and every other appendage. If he has a garden, he knows the value of his kitchen and other refuse, and trains up his children to a practical knowledge of the same laws of cottage economy; for you may see them a mile from the cottage with their small carts and wheelbarrows collecting the droppings in the lane or road, and wheeling them home to the garden; and if he has not a garden, he knows that his master will always give money for manure, besides "thanks" to the youngsters. To those who can appreciate the subject from a practical point of view, such details must be familiar. On the other hand, bad characters very soon make good houses bad ones. First one pane in the window is broken, and stopped with some old rags, and then another. The wicked boys, in killing sparrows on the house-top, break the tiles, or slates, or thatch, as the case may be, with stones. Windows, doors, and gates are left open to the mercy of the winds. The cottager, on his return home, may curse and swear, and even use the rod with parental authority. As a workman he may be a first-rate hand, and his wife may be as talented as himself; but nevertheless it is surprising how soon the cottage becomes so dilapidated as to be unfit for the habitation of a decent family.

We now come to the pecuniary question of interest on capital. A landowner is anxious to build farm homesteads and cottages upon his estate. The buildings must be of the very best style, cheap and durable, furnishing suitable accommodation for man and beast. "Can you give me a design that will return interest on capital?" Such is the question put to professional men.

To this important question only one answer can be given to a landlord, that will bear scrutiny at the bar of practice, and that answer is, in all plainness, briefly this: It is not your buildings that pay the interest, but the tenants, cottagers, and cattle you put into them. One tenant, for example, will make the homestead pay ample interest on capital, while the undertaking would ruin another, and ultimately thus fall back upon the owner as a profitless speculation. So it is with the cottage and garden. No capital will more enhance the productive value of an estate than that which is judiciously invested in the erec-

tion of suitable cottages for agricultural labourers, provided they are occupied by industrious, frugal, Christian families, and properly employed; while, on the contrary, much better for the landowner to throw his capital into the fire than cumber his estate with labourers of immoral and depraved habits, having rising families whose hands are continually in some mischief or other day or night.

Into the practical exposition of these general conclusions it will be unnecessary to enter at any great length in the columns of an agricultural journal, as our readers must be presumed familiar with the facts of the case in detail. It is, of course, the produce of the land, animal and vegetable, that pays for all. Apart from the land, the homestead and the cottage would be worthless to the landowner. The two form a species of machinery, which has a certain mechanical function to perform, and, like every other implement of husbandry, only return interest on the prime cost when placed in the hands of honest, industrious, and efficient workmen. In the hands of such, they increase the marketable amount of produce to an extent far greater than will cover redeeming interest on the capital invested in their erection.

And this, too, is not all. Thus there is not only an increase of produce annually, but also a very great economy of that produce, and of the implements and everything upon the farm with which the cottager has to do (confining our observations exclusively to the case of the cottage, leaving the homestead to another occasion). The good cottager takes care of his cottage and garden, as already shown, and also of his master's teams and property. He and his partner keep everything clean and in its proper place. Their wearing apparel and bedclothes are always kept clean, and free from smell and everything injurious to health. The amount of noxious matter exhaled from the body and lungs of a hard-working man during night, when the reparative processes are actively going on in restoring muscle and nerve to their normal strength and vigour, for to-morrow's toil, is very great. So is it from the lungs and bodies of an active, healthy nursing mother and child. Sleeping-apartments, therefore, require to be large, in order that these reparative processes may be normally and healthily performed, so as to restore the labourer to his full degree of strength and usefulness. We need not go further into detail, as the reader will readily perceive that, from the data thus advanced, it follows that the cottager with suitable household accommodation is physically able to do more work than when such is too small. In other words, a good roomy cottage will pay interest when one too small will not.

On the other hand, the bad character, whose nerves and muscles are always in a relaxed, abnormal state, from a dirty house and depraved habits, is never fit to do much work. You may goad him on for a little, by standing behind him or bribing him with beer; but the moment your back is turned about, his overtaxed system must have relief. We are not insensible to the fact that there are short-sighted economists who think they can take more work out of such "devils," as they are not unfrequently termed, than out of honest Christian men; but such conclusions are the wildest and most barren dreams imaginable, what is presumed to be realized being absolutely impossible. According to the old proverb, "Like master, like man;" and just as it is in the adage, so is it in the case before us; for when we enter upon the inquiry practically, there is more than one "devil" in the story. If the ploughman stops to take his glass at the beer-shop, for example, and then gallops his team to make up for the time, then those who approve of such conduct will be found, in nine cases out of ten, to have a gentle way of doing the needful stimulus themselves, although perhaps they do not see it. When the teams are thus overdriven

and otherwise neglected, they require stolen corn. We need not drag the reader through the implement department of the farm, nor yet take him to the cow-hovel and the sheep-pen. But, returning to the cottage itself, and granting that in style it is a palace, it is, after all, full of dirty clothes, rotten rags, and everything going to the dogs; and if it is weather-tight, it is absolutely worse for the poor man's health and reparative processes than were the winds whistling about his ears at midnight. In short, the produce of his labour falls far short of that of the preceding example, while his cottage, teams, and implements are more expensive to keep in repair, and eventually require sooner to be replaced by new ones.

Between these two examples there is a wide difference; and that difference, as already stated, will pay ample interest on the capital invested in the erection of the cottage and garden. It is therefore the duty and interest of landowners and their tenants to provide good cottages for all the honest Christian labourers they can select; and as the labourer, in return, gives more work and attention for the good cottage than for the bad one, it is manifest that he should not also pay the interest on the capital to the landlord, as that would be more than interest twice-paid by him.

LABOURERS' COTTAGES NOT ON THE FARM.

When the ploughman's cottage is not upon the farm, the relation that exists between it and the farm is a species of bastardy. In the English counties, perhaps the majority of labourers' cottages belong to this order, being situated in villages, hamlets, and towns. In some cases they are upon the landed estate of the proprietor of the farms where the cottagers are chiefly employed; in others, upon the freeholds of the tenants; in a third upon the freeholds or long leaseholds of merchants, manufacturers, or the like; and lastly, in a few instances, they belong to the cottagers themselves, who live on their own freeholds. In each of these cases, the relation is somewhat different from the others; but compared with the relation of the cottage, when situated upon the farm, they all possess one distinctive characteristic of illegitimacy, for when at work the cottager is from home, while both he and his family are non-residents. They are in a measure aliens, for the farm is not their birthplace, but the village; so that their interest is divided, and too frequently lies more in the latter than in the former. Each case, however, requires to be examined in its own light, to be thoroughly understood; and for this purpose we shall briefly examine the above four cases separately, in comparison with suitable cottage residences upon the farm.

The first example is where the cottage belongs to the same landowner as the farm on which the cottager is employed, but is situated in the village, hamlet, or town, as the case may be.

When the farm homestead is also in the village, as is very common in many of the English counties, the situation of the cottage is not objectionable as to the distance the labourer has to go to his work. But when the farm is situated at a distance from the village in which the labourer resides, the case is very different; for then a portion of his time is daily lost, while he is not able to perform the same amount of work as when resident on the farm. We are here, no doubt, entering upon controversial ground. Of this we are sensible, having over and over again argued the question both with village cottagers and their landlords, who laboured under the fallacious notion that half a mile or so was of no practical importance. But those who entertain absurd notions of this kind are self-interested advocates of the village system, and wholly ignorant of the physiology of their bodies, and therefore unqualified to open their mouths on the subject; their

opinions being anything save an ornament to their profession. Let us briefly examine the facts of the case under both these hypotheses—first, the cottage and homestead both in one village; and, second, the cottager has to walk half a mile to the farm.

In the first case the cottager and his employer are both tenants of one landowner, and reside in the same village. Some labourers are very proud of thus holding on a footing of equality with their masters, and not a few landowners are equally short-sighted, and conclude that cottagers ought not to be subtenants, but pay the rents of their cottages directly to them.

There are, however, several valid objections to this system. In the first place the cottager has nothing to give but labour for his cottage, and as he never gets the full value of his labour in a productive sense, his employer always pockets the lion's share of the advantages or disadvantages of a good or bad cottage. In other words, farmers, like all others who employ labourers, have a certain profit on each. To this they are justly entitled, to cover risk, losses, interest on capital, and value for their own time and skill. But although agriculturists derive a profit from the work of their labourers, generally speaking, it must be borne in mind that it requires sharp management to do so; and that a very large number of them are actually losers, besides being slaves themselves into the bargain, so to speak, the whole value of the produce sold being insufficient to cover the rent and the accounts for labour and manure. The tenant sells the produce of his farm in the market for what it will bring; and the labourer sells his labour for what it will bring; but the price or wage the latter receives will not cover the interest on the capital required to erect for him a suitable cottage and support himself and family with the daily necessities of life. If he pays a long rent to the landowner for a good house, he has too little remaining with which to buy food, clothing, and firing, and educate his children, so that he is unable to perform his task without impairing his health, and thus prematurely throwing himself and his family upon the Union. If, on the contrary, he pays a small rent to the landowner for a bad cottage, he has more for the daily necessities of life than in the previous case; but as the reparative processes in restoring the tear-and-wear upon his toilworn nerves and muscles take place principally during night, when he is in his own house, they are abnormally performed, so that his health suffers from imperfect household accommodation, thus throwing him again upon the Union in old age, and nursing an unhealthy family, which have also largely to be supported by private charity and poor-rates. But to this and other consequential pecuniary questions we shall return, after having examined the other objections.

In the second place, landowners derive a profit from work performed by the labourers employed on their estates. Thus the whole productive value of the cottager's labour does not go into the pockets of the cottager and his employer the tenant. On the contrary, the lion's share not unfrequently finds its way into the coffer of the landowner in the form of rents paid by the tenant and cottager. As already shown, the cottage is of itself a non-productive investment, for unless the labourer finds employment he has nothing wherewith to pay his rent to the landowner. The land, on the other hand, yields a crop annually, but not without labour. Without labour the land would be worth nothing to its proprietor. True, he may leave it in its natural state to produce just what it will—say, for the sake of argument, wild geese, ptarmigan, &c., &c.; but even then, either he himself must catch the goslings, &c., or he must employ somebody else to do so, before he can support himself according to savage life. If he advances a step in civilization to pastoral life, herdsmen and shepherds are necessary. If he breaks up his land to aration

he must either hold the plough himself or employ a ploughman. And if he lets his land to a tenant for so much rent yearly, it is only adding another link to the chain of industry. And when we further follow up the subdivision of labour in the cultivation of land to its present state of progression, the humble cottager, after all, still remains the first link and the chief link at the lower end of the chain, and the landowner the big link at its opposite or upper end. The landowner may talk of his rents, the tenant of his profits, the implement maker of the price of his steam-plough, and the cottager of his daily wages; but collectively viewed as a whole, the sum total is the produce of labour, and depends more upon the poor man's toil or link than any other individual link in the chain; for, like the first link in any other chain, it has to bear the catenary or weight of the others. If it is a strong link, it will bear a strong pull of the landowner and his tenant; but if a weakly one, the upshot need hardly be told, for the landlord and tenant must inevitably fall upon (if not break) their noses if they apply more force than the weakly link at the lower end of the chain will bear at which they both thus pull!

In the third place, it is unfair to ask the labourer to pay more rent for his new cottage than for the old one, on the grounds that he will enjoy better health in the former and thus be able to do more work for his employer and his landlord, and also keep himself and family out of the Union! The unreasonableness of this proposition is almost too manifest to permit of any practical illustration, for, figuratively, it is burning the poor man's candle at both ends, the one end blazing away to please the laird, the other to enlighten his tenant!! In other words, it is making the cottager pay twice for the increase of house accommodation he receives; which, in point of fact, is impossible in practice, as has already been shown; for when he pays more for his cottage it must be at the expense of his diet, and consequently health; otherwise the farmer must pay more wages to the labourers and less rent for his land.

In the fourth place, the practice involves the highly objectionable doctrine of *serving two masters*, more especially when the farmer is bound by his lease to employ the village cottagers of his landlord, or in the absence of such an objection in his lease, it is implied by the custom of the district; or when he has the unfortunate alternative of supporting the village cottagers in the Union if he does not employ them on his farm! This is an objection that would require a long article to do justice to its details, owing to its iniquitous character relative to the manner in which it saps the foundation of the religious, moral, physical, and industrial welfare of agricultural labourers.

Collectively, little requires to be said on these four objections. It is very clear, in the outset, that the landlord, if he sees his own interest and that of his tenant and cottager, should let his village cottages to his tenant, and only draw one rent. In the second place, it is equally manifest that the cottager should enjoy a suitable cottage rent free; for the better his cottage, and the higher the bill of fare for him and his family, the more work done by him, and the less he requires from the Union; and, *vice versa*, the worse his cottage the less the quantity of work done by the cottager, and the heavier the poor rates required by the Union. This is brief, but practically conclusive.

Our next proposition is the waste of muscular power sustained by the cottager when he has to walk half a mile or so daily to his work, and an equal distance in returning home at night. To this loss must be added another, that of the cottager and his family dieting separately.

The first of these is a plain problem in applied mechanics that admits of a tangible solution. Thus, if the weight of

the labourer is 10 stones, or 140 lbs., and the extra distance he has to walk daily a mile, then his nerves and muscles carry this weight of 140 lbs. a mile, which the other labourer has not to do who is employed by the farmer whose homestead is situated in the village. Generally speaking, travelling to and from his work is the hardest labour experienced by the cottager, so that, practically, it may be considered nearly equal to an hour's work daily, or ten per cent. added to the expense of his labour—a cost that would do far more than build a suitable cottage for him upon the farm. We have heard the contrary argued, as already stated; but before such could be proved the poor cottager would require to be "*lighter than a feather*," instead of the minimum weight of 140 lbs., which we have assumed!

The loss arising from a divided dietary, when the cottager takes two of his meals in the field and only one at home with his family, is not so easily estimated. That, however, does not reduce its magnitude one *iota*, or lessen the domestic consequences to which it gives rise, for it is attended with a thriftless system of cookery, or rather no system at all; while the sweaty cottager often suffers hardships at the hedge-side in the winter season that stiffen him, thereby as it were hurrying him to the Union and his latter end, contrary to the natural order of things. Heartless, dissolute characters, who care little about starving their wives and children at home, may prefer the hedge-side or anywhere else to the family table at their own firesides; but we have always found honest labourers put an incalculable value upon the privilege of dieting at home with their families; and it is a privilege, too, which every Christian cottager ought to enjoy, for of its manifold value a single question to the contrary cannot be validly raised. In hay and corn harvest it may have its drawbacks, when the workmen are engaged at a distance from their own houses; but, when practically considered, such is more than counterbalanced, so that it is the reverse of an objection to the general rule, the very contrary being experienced, as it brings the whole family into the harvest field to meal and work together.

When the cottage is upon the freehold of the farmer, the cottager is thus his tenant. In this case, it is the interest of the farmer to give his cottager a good cottage; but he will require to keep a sharp look-out, or his own landlord, to whom he pays rent for his farm, will pocket an undue share of the produce of the cottager's labour. In other words, he ought to give his labourer a good cottage rent-free, as stated above, and to pay his own landlord less rent for his farm by the interest upon the capital invested in the cottage and garden. If the rent of the cottage and garden is £8 yearly, then he ought to make his landlord pay this, and not the cottager. In other words, he ought to keep it out of the rent which the farm would be worth, were the cottage built by the landlord near the homestead.

In theory, this is a very simple question in subtraction; but it is one that is attended with innumerable difficulties in its reduction to practice. If the farmer and his cottager both live in the same village, the objection to the distance of the labourer from his work does not exist; but if otherwise, the reverse will be experienced. In short, the exceptions are few where cottages upon the freeholds of farmers will bear a very close examination, under the several heads at issue.

When the cottager lives upon the freehold of a third party, such as a village merchant or manufacturer, the case is still worse in every respect. If it is bad for the cottager in the outset, whose wages will not allow him to pay rent for a suitable house, without subjecting himself and family to the process of starvation, it falls still more heavily upon the farmer and his landowner in the end, who have to give for a depreciated description of labour

much more than it is worth, and also to pay extra-high poor-rates to support an abnormal state of industry and domestic economy, wholly incompatible with the present progress of Social Science. And just so long as such a short-sighted system of cross-purposes exists, it is hopeless to expect any improvement either in the condition of agricultural labourers or in the grinding amount of poor-rates necessary to support it.

The last class of cottages we have got to notice are those which belong to the cottagers themselves, when they live upon their own freeholds. An honest freeholder is always a man of some standing in a country village or town; and to this rule the agricultural labourer is not an exception. The pity is, that there are not more freeholders of this toil-worn rustic order. Does not the fact of the paucity of their numbers prove the soundness of the doctrine which we have hitherto been endeavouring

to lay down—that, apart from the land or farm upon which the labourer is employed, his cottage is a non-paying concern? In other words, unless he can command extra wages for his labour, he is a loser by living in his own cottage, especially when it is situated at a distance from his work.

Such is a very brief review of the village cottage system for agricultural labourers. That it is out of date requires no proof. The really practical question is, to get out of it with flying colours. In the annual controversy on the subject, much is said about poor-rates; but there is another, rather a delicate one, that requires practical handling—viz., the *political system of freehold voting*. All evils, it is said, ultimately work their own cure; and it may not inaptly be said that the village cottage system is fast writing its own epitaph, in this sense. E.

AMERICAN AGRICULTURE AND STOCK-BREEDING.

The results of the last American census enable us to look somewhat into detail in many of the branches of agriculture and stock-breeding; that is, supposing any degree of reliance can be placed in the figures collected over so large an area, and under difficulties which must necessarily make the complete authenticity of these returns questionable. However, we must take them for what they are worth. We have already, on a former occasion, touched upon the statistics of sheep farming, and the progress of woollen manufactures in the States; and we may now glance at some other facts connected with live stock and their products.

The tables of agriculture show a satisfactory increase in the live stock of the country in the decennial period. In the whole number of states and territories, horses have increased from 4,337,000 to 6,115,000; asses and mules from 559,000 to 1,129,000; working oxen from 1,700,000 to 2,240,000; milch cows from 6,385,000 to 8,729,000; other cattle from 10,293,000 to 14,671,000; sheep only from 21,723,000 to 28,317,000; swine from 30,354,000 to 32,555,000. The aggregate estimated value of the live stock has doubled in the ten years, and the present value is set down at £221,500,000. The value of slaughtered animals, which in 1850 was returned at 111½ million dollars, had reached, in 1860, 212½ million dollars—the largest part of the increase being in the Western States. The manufacture of soap, candles, leather, glue, bone-black, and others depending on this source for their material, have received a proportionate development.

No better evidence of the progressive improvement of American agriculture need be adduced than the great amount of animal forces employed to assist the labour of man. The number of horses, mules, and oxen engaged in agricultural labour is probably greater than the number of men—a proportion that has no parallel in any other country. All of this animal force is of course made available through some form of machinery. Within the last ten years the use of the reaper and mower has become not merely general, but almost universal. Some of the most important crops are now seeded, cultivated, gathered, and prepared for use or market, with little or no labour from man, except when he is aided by mechanical appliances and animal force. The employment of steam in agricultural operations is much less common in the United States than in Great Britain, but is gradually increasing.

Turning to dairy-products, we find that the quantity of butter produced in the year 1860 is set down at 460½ million pounds, being an increase of 46 per cent, on the

product of 1850. The amount of cheese returned is 106 million pounds, or 339,000 pounds more than in 1850. Cheese is especially rich in flesh-forming constituents, and is therefore regarded as a highly nutritious article of diet, well adapted to the use of the labouring man, and capable of doing more to repair the waste of muscular exertion than many times its weight of butter or of fat meat. Still it appears that cheese does not enter largely into the daily food of the working classes of the States, as it does in Germany and Great Britain. Were it produced more abundantly, and sold at a lower price, it is probable that an article of food so convenient and economical would be more freely used. The cheese exported from the United States to other countries is about 15 million pounds annually. Were cheesemaking as well understood generally as it is in Europe, the demand would be greatly increased. Comparatively little of the prodigious quantity produced can be termed a first-rate article. While many enterprising dairymen supply an article creditable to the country, in Europe American cheese is not held in any high estimation, and for the reason that the processes have not reached that perfection which alone contributes to uniformity of excellence and distinctiveness of character. An article so nutritious and easy of transportation would, one would have supposed, have formed some portion of the army rations.

The consumption of mutton in North America has rapidly increased. The supply now as rarely exceeds the demand as with any other meat, and the best qualities outsell beef in the principal markets. No country is better adapted by natural, and on the whole by artificial conditions to the production of wool, than the United States. Australia and South America contain the only very extensive regions of the earth now capable of competing with equal areas of North America in the production of this great staple. The price of land in Australia is much higher than in the United States: its distance from the wool markets of Europe equals nearly half the circumference of the globe; yet its exports of wool rose, between 1810 and 1862, from 167 pounds to 68,000,000 pounds! South America is also becoming an extensive producer of this staple: there were imported into Great Britain alone, in 1861, 6,000,000 pounds. Yet South America has no natural conditions of superiority over North America for sheep farming, while there are political and moral ones which undeniably are hostile to the security and permanence of so exposed a branch of industry. Apart from the mere question of the cheap production of

wool, the experience of the most advanced agricultural nations, like England, Germany, and France, goes to show that sheep are a necessity of a good general system of husbandry, on even the highest-priced lands and amidst the densest population. They afford as much food to man, in proportion to their own consumption, as any other domestic animals. They are believed to return more fertilizing matter to the soil. In addition, they alone furnish wool. England is estimated to have about 590 sheep to one square mile, while the United States proper (exclusive of Territories) has only 48.

Among the embarrassments which still interfere seriously with farming operations are the diseases of domestic animals. Two forms of disease have more especially attracted attention—the pleuro-pneumonia of neat cattle in Massachusetts, and what is known as hog cholera in the Western States. With respect to the former,

prompt and energetic measures were adopted in the State to prevent its spread to other parts. The disease which prevailed among swine caused great destruction, and, unfortunately, but small success attended any efforts devised to arrest its progress. These visitations, with others of more common occurrence, have suggested the necessity of a class of well-educated veterinary surgeons. In this particular, most European countries are greatly in advance of the United States. There is nothing about the rural economy of the Old World from which the Americans may so profitably learn a lesson as in securing skilful medical and surgical treatment for domestic animals. This necessity has been made still more apparent by recent losses of army horses. The multiplication and cost of insurances on live stock also furnish proof of the little reliance placed on the skill of the professed cattle and horse doctor in the States.

“SHAM” PRIZE ANIMALS—FARMERS ON LIGHT AND FARMERS ON HEAVY LANDS—THE MALT-TAX.

At the Royston Agricultural Society, the Earl of Harwicks said: With regard to agriculture, he was one of the least likely of any in that room to be able to tender information on that point to farmers whose daily occupation was the tillage of the soil. His mind had been devoted to other matters, and he had only taken up agriculture as an amusement—an amusement which, he was sorry to say, had not proved a profitable one. The association had awarded him a prize for an animal that day. Now, no doubt, there was some reason which had induced the judges to give him that prize; but he said at once that there was no credit due to himself. He was not going to reflect upon the judges, because they were the agents of a system; but he objected to the system altogether—to the system of competitive examination of animals, as at present carried on—from beginning to end. The examination was meant to decide which animal would give the best food at the least cost in its creation. The animal he had shown had been brought up on the best fattening food, without regard to cost, and its success in the prize list was no credit either to him or to the animal. That animal was a sham. For many years past he had shown animals, and had won prizes at Smithfield and elsewhere by showing shams. But he never had, and never would have any other opinion than this—that at a show of fat animals nobody ever thoroughly knew how they become so fat; and the consequence was that the prizes, being adjudged for fatness, the prize animals did not always produce the best meat. The most really profitable matter was in making food fit to eat. He might be asked how he would have the competition carried on? He replied, that they must show animals fed in a reasonable way, and that the competition should be carried on something in this wise: Suppose that Mr. Samuel Jonas and others, eminent members of that society, whom he saw around him, agreed to compete for the prize. They should agree what the age of the exhibited animal was to be, and that should be the whole question so far as the proprietors of the competing animals were concerned. The animals should then be fed, stalled, and stabled in the same manner, and, at a fixed period, should be brought before the judges, for them to say which was the best frame for them to put fat and meat upon, and which frame would be most productive altogether of eligible and profitable food for the public. He saw no difficulty in carrying that out. There should be a shed or building in which all the animals should be placed, in the hands of a competent and trustworthy man. Each should have the same amount and weight of food, water, straw, and other comforts. All should be treated alike, and, at the end of a fixed period, should be produced to the judges to say which was the best. That would be competition. But his animal that day got a prize, being shown against animals which probably had not been so fed; and, therefore, he

said that the present system was utterly useless as a test of real merit. He spoke of that animal as a winner: he dared not have spoken of him as a loser. Still, he was prepared to agree that agricultural shows, with all their faults, were, upon the whole, greatly beneficial. One value of keeping up such meetings as that was, the friendly intercourse they brought about. Those present lived in what might be called a peculiar country, and, during thirty years' residence, he had been particularly struck with two or three things. They had in the county a great variety of soils and a great variety of men. In what he was about to say, no farmer must think that anything derogatory to his character was intended. There were many rich farmers who entered the field with great capital, and there were many poor ones who entered possessing great industry and a desire to labour; but small capital (he did not say it was any disgrace to be poor) was detrimental to business; and it required good capital to carry on farming operations properly. The friable, light, and easy lands of that county, though not productive of very heavy crops, yet returned heavy balances; and on these they saw a different class of men to those on the heavy lands, which required three or four horses to the plough, great attention to drainage, and great labour. On the latter, they found that the poorer and hard labouring men generally took up their abode; but what did it come to? Most of them present were not the better persons, but the better class of farmers; and he said that, from such an assembly of the better and richer class, something should go forth to instruct the poorer—from the upper to enlighten the lower class. Now, he saw by speeches in the newspapers that the richer and more enlightened class talked of chemistry, of theoretical cultivation, and of the deep sciences as connected with agriculture; but they never heard anything from them as to how to farm land before they got to chemistry; and he thought that if they talked of practical matters, it would be more useful than talking of chemistry or theoretical ones. He said, then, that the farmer, to be successful, must be an early riser—soon in the saddle; that he must see his labourers at work during the day, must allow no more rain water to accumulate than was necessary, and that no springs be allowed to remain without proper control. Next, he must plough well and clean well his land; then proceed to sow well, and see that nothing remained on the land that would be productive of rubbish, instead of corn. After that, chemical operations might be brought to bear with success. Before, chemistry would be nothing but rubbish, instead of being a power in their hands. He had heard a great deal of rubbish about scientific farming. What was the science of farming? That science was vigour, activity, sobriety, zeal, good ploughing, good sowing, good following, good weeding, and a trust in God for the rest. The matter of cottages for labourers appeared to

him to be a landlord's question entirely, and not a farmer's. It was an important question, and one which all rich men or men of moderate revenues would do well to attend to—in fact, one which they should make some sacrifice to attend to, and an imperative duty upon those who could build model cottages, and could afford the sacrifice. But, if landlords were not rich (if their lands were not large enough) they could not do it; they could not afford it unless there would be a remunerative interest on the expenditure. If cottages would return ten per cent. upon the outlay, they would be built everywhere—there would be no difficulty about it; but it was not so, and, consequently, the cottage-building question in an agricultural district was one of pure charity. It was not a paying matter, to build good cottages: if such were the case, there would be plenty. By a good cottage, he meant one that was not built of mud or of wicker, but of brick, well lined, and with a slated roof. But a good building cost money, and should give back a return: if they did not, they would not be built. They might talk till they were black in the face, but they would not, unless the estates were in the hands of rich landlords. If rich landlords neglected the erection of these buildings, they neglected a valuable and useful duty. But he was not going to charge such neglect as a crime. If they were built, however, the builders would reap their reward—not in a monetary return, but by their labourers becoming a far more respectable and a more athletic race of men.

The Hon. E. T. YORKE, M.P., desired to say a few words on a subject which must very soon become a subject of discussion in the House of Commons, if not of strong remonstrance against its continuance in its present shape. He need scarcely say that he alluded to the malt-tax. He had been present at an agricultural meeting where the question was pointedly asked of the representatives present: What was their opinion of the tax? He would not wait for the enquiry. Those whom he addressed had honoured him with their confidence for thirty years; and he thought so long-enduring a connection justified him in anticipating questions, and without any other inducement whatever than that which sprung from the most conscientious motives, at once to effect the subject, and state his opinions. It was no desire to make what was termed political capital out of this much-versed question. There was an association established, whose duty it was to bring it to an issue; and an inquiry was going on by which that issue might be directed. So that it was no more than the avowed duty of a county member to declare his opinions on what he must say was a strictly agricultural question, intimately connected with great principles, and with the interests of farmers. Gentlemen, he said, had you been of the same materials as that troublesome old lady mentioned in Holy Writ, who wrestled from a procrastinating, if not an unjust judicial functionary, a judgment favourable to herself, by continued importunity, this tax would have been abolished, or at least somewhat modified. Her conduct at this time is worthy of imitation, and I counsel you to adopt a similar course. Mr. Yorke then applied himself to the peculiar characteristics of the tax itself. He said it might be considered in a threefold aspect—as a social, a financial question, and, above all, at this time, as one of paramount injustice to the interests of the farmer. He said he would not intrude on the meeting with figures: his opinions were based on general views; and with those only he should deal. As a social question, then, so far as any benefit was to be conferred on the poorer classes, he thought that a better article would be supplied than at present; but he was of opinion that, even if the tax on malt was repealed, that the great capitalist would still hold his own, and that the monopoly of brewing was not likely to be invaded, nor touched by the reduction or repeal. As a financial question, he knew how difficult of adjustment it must be. To displace between five and six millions of revenue in these times of increased national expenditure was no easy matter; and it was clear that the deficiency must be made good from some other source; but that was no real ground for its maintenance. The argument of great injustice could scarcely be applied to any other impost at the present day; and it was a matter between the Chancellor of the Exchequer and the public revenue. It was not for those who desired the abolition of this enormous

duty—as interfering in carrying out domestic arrangements, and the use of their own produce as it pleased them, in a manner most conducive to their prosperity, at a time when the continued maintenance of free-trade principles was inculcated, and its advantages proved—to substitute other changes in its place. He called attention simply to the fact of its existence, as a glaring injustice, as a violation of those principles which the progressive tendency of the age had sanctioned. And now (said Mr. Yorke) I come to the last item of objections; and I have already partly alluded to them, so that I shall not detain you at any great length. I consider the tax, as I have said, a gross injustice—a violation of principles already sanctioned and accepted as the law of commerce and of trade, a breach of contract with the agricultural body, implied by, and entered into at the time of the repeal of protective duties, and, on those grounds, indefensible, and worthy of your most strenuous efforts to repeal and annihilate it. That it is not so difficult as may be imagined has been proved, since we have had one Chancellor of the Exchequer (Mr. Disraeli) who made an attempt at its diminution; and, although he failed to accomplish his purpose, he indicated that its removal was possible. When Mr. O'Connell (said Mr. Yorke) urged particular advantage for Ireland, he used the words "Agitate, agitate, agitate!" When Sir Robert Peel—that Gamaliel under whom we first enacted the rudiments of protective laws, and their beneficial influence on agriculture) was desirous of increasing his Parliamentary support in the House of Commons for their maintenance, he said, "Register, register, register!" Significant words. Let us apply them to this subject. I say, unite then: "Agitate, agitate, agitate! Register, register, register!" Such high authorities as I have cited, when influenced to gain and maintain any given useful object, justify you in adopting a similar course, when the object is hurtful in practice and unjust in principle, to defeat and avoid it. What is denied to justice, seek by importunity. Agitate the question; register those who are favourable to its repeal; and, as all great questions have been carried by such means, use them now. As the hop duty and paper duty fell before continued sap and assault, so use the means in your hand that this duty, on the score of its gross injustice, no longer encumber the progress of your agricultural prosperity. The question has its difficulties. I know them all; but its injustice is its best solution of them, for when did an injustice, acted on by popular will, long prevail against its concentrated action?

Mr. ADEANE, M.P., said: The question of the malt-tax had been touched upon by his honourable colleague, who took rather a different view of the subject than that which he (Mr. Adeane) took. This tax produced five millions. Were it taken off, what could be put in its stead? Should the Government think fit to make up the deficiency which would arise from taking off the tax upon malt, by putting it upon the income-tax, would that please the farmer? (No, no.) The tax upon paper was gone, and could not be re-imposed. It was an undoubted fact that the prosperity and revenue of this country were increasing, in spite of the American war and Lancashire distress, so that, on the return of peace, we might still hope for a surplus, and, consequently, a reduction of taxation. The Chancellor of the Exchequer had not shown himself insensible to the interests of the farmer, for, a few days before the end of the session, he had granted a committee to inquire into the merits of the use of malt in the fattening of cattle. The same committee would be appointed next session; and he (Mr. Adeane) believed that if the Chancellor of the Exchequer had a surplus, he would reduce the tax, as he had done in the case of the hop-growers last year. He wished to see the tax reduced; but he would not support the motion should it be brought forward after the publishing of the Budget. He had nothing to say against the farmers agitating on all questions which they considered of vital interest to them; and, if they did so, they would probably get their own way some day. He would now leave the question of the malt-tax, and turn to agricultural societies. He did not quite agree with Lord Hardwicke that well-fed beasts were shams. He considered that prizes were given at these shows to the best-shaped animal. A badly-shaped bull or cow would not become a good one by any amount of feeding.

THE PRIZE AGREEMENT.

It would seem that prize agreements are not destined to prosper. That of the Suffolk Society was no sooner circulated than it was condemned, while the selected of the Staffordshire Society is as directly attacked. In fact, there never was such an apple of discord as my Lord Lichfield's premium. Successful or not successful, the rejection of any one of the several forms is sure to be the signal for some very demonstrative dissension. There was quite a scene the other day, on the reading of Mr. Chawner's rejected address, at Cannock, and the publication of Mr. May's more fortunate attempt threatens to overwhelm the *Staffordshire Advertiser* with notes and comments. We may take it as a principle, in the outset, that any one precise form of agreement would not be susceptible of general adoption, although the leading features of such a contract might surely be made to work very well in most districts. Confining, however, the prize form to the neighbourhood from which it originally emanated, it may be both amusing and instructive to gather what is really thought of this about home. T. R., then, objects, in the first place, to the game clause, which "appears unfair, and almost inoperative. The cases in which large landowners let their game to a third party are very few, and yet these purely exceptional cases are the only ones in which compensation is even proposed. This is a real grievance which *must* ultimately be dealt with, and in a different spirit." Again, the same writer considers "the clauses as to selling off hay and straw very objectionable. The practical effect would be to prevent the use of artificial manure, where such would benefit both the landlord and tenant. Let the tenant dispose of the produce of his farm to the best possible advantage, purchasing lime, bones, guano, or other manure, to the money value of hay or straw sold off, producing vouchers for the amounts, and both parties would be gainers"; while the clauses as to cropping are "far too restrictive. Such restrictions only retard and paralyze enterprise, progress, and those discoveries of improved modes of culture." T. R. expresses himself with much force and weight; but it does come out that he was one of the disappointed. We have next A. LOVER or JUSTICE, who maintains that "an agreement to be really good for anything, or worthy of either notice or approval, ought at least to be consistent with itself in all its covenants and provisions. Now, in the case before us, it is covenanted in the 6th clause of Mr. May's agreement 'that the tenant shall not have more than two-fifths of the arable land in his possession in wheat.' In his view, therefore, it is in accordance with good and profitable husbandry, and fair to the landlord and tenant, that he shall have this proportion of his arable land in wheat, but no more. But in the 14th clause of the said agreement it is covenanted 'that at the expiration of the tenancy not more than one-fourth part of the arable land shall be in wheat!' That is to say, supposing there be in the farm in question 100 acres of arable land, there may be in due and authorised course of cultivation forty acres under wheat; but if it be so found in the last year of the tenancy, the tenant will have violated the 14th clause of his agreement, which says he shall have but twenty-five acres, or one-fourth of the whole of the land designated as arable, in wheat. The question then arises, 'Cui bono?' For whose interest? Certainly not for the interest of the tenant; for he will have to disarrange the course of previous management, and leave unsown twenty-five acres of land duly prepared for wheat, and thus sacrifice to the

landlord or to the in-coming tenant the profit that would arise from his fair share of the wheat crop on such twenty-five acres! Would my Lord Lichfield, or any other noble lord or proprietor, in our county, wish for such sacrifice at the expense of an out-going tenant?" However, this is only found to be in keeping with "another very objectionable covenant as to game trespass, and the courtly provision that it matters little how far a man's crops may be injured, his best hopes blighted, and himself and family exposed to ruin, so long as it is done by the friendly hand of his own landlord—so long as the game is not let to a third person. The question of damage or injury is not worth a moment's consideration. A very delicate and costly compliment indeed on the part of a tenant-farmer to landlords, but unfortunately at the expense of the hard-working, industrious, but perhaps ruined tenant." There is a deal of sound sense and hard hitting in the criticism of this friend to justice; and so we pass on to VIVRE (LIVE), who counts up to sixtily in his bill of exceptions, and in this wise: "*Firstly*, it does not provide for the payment of the *tithe rent-charge*, which on some farms amounts to 8s. 6d. per acre. This, it is submitted, should be paid by the landlord, it being a rent-charge on the farm, and payable whether it be occupied or not. It may be suggested by some that if it is to be paid by the landlord he will put on the tenant by way of increased rent. Well, so be it. Let it be so put on. It is a rent, and if it be added to the other rent, a man, before he enters upon a farm, will then see at once the amount of rent he will have to pay, and be more competent to judge whether he will be able to pay it. There is something sneaking and unfair in getting a tenant to pay rent charges, issuing out of a farm of which he is not the owner. *Secondly*, the *land tax* is clearly a landlord's tax, and ought to be paid by him, as also the chief or quit rent: the latter, in some cases, amounts to £3 or £4 a year. *Thirdly*, If the tenant have the farm on lease he should insure the buildings against loss or damage by fire, and pay the renewal premiums, and produce vouchers. But if the letting be from only year to year, then the insurance and payments should fall on the landlord, the tenant having only a short limited interest. *Fourthly*, it should be plainly understood who is to pay the property or income tax. It prevents misunderstandings, which sometimes lead to an early 'notice to quit,' and that is frequently disastrous to the tenant, and, in most cases, no gain to the landlord. *Fifthly*, I do not find any provision made to meet the case of the bankruptcy or insolvency of the tenant. *Sixthly*, from farms near to large towns, the tenant should be allowed to sell hay and straw annually, to a certain extent, bringing back proportionate manure. And (see clause 10) it may not be necessary to scour up the ditches *every year*: it is attended with great expense and little profit. In clause 12, as to the appointment of an arbitrator, it is submitted that it should be limited to the landlord and off-going tenant. And see the last clause. There can be no *et ceteras* in agreements or leases; everything must be distinctly defined and stated, and ought to be so in words of the plainest kind." LIVE is worthy to hold his own with the other commentators, for there is a deal of good matter in all he advances, and a tenant cannot know too clearly nor too soon all he will be liable for. Then, ALPHA harks back to the old grievance, and is fairly at a loss to understand "However the noblemen and practical agriculturists comprising the com-

mittee could award a prize to an agreement which leaves unsettled the *vezata questio* of game between landlord and tenant *direct*, and only name a compensation when the game is *let*, as I with most and all know the unpleasantness that arises from keepers and game?" while A MAN OF STRAW suggests in preference to "loading the proposed agreement with old-fashioned clauses of the restrictive character comprised in Mr. May's form, that, instead thereof, if at the end of the tenancy the farm shall have been deteriorated in value from any cause on the part of the tenant, the latter shall pay such a sum as would by investment yield annually to the landlord what he may have lost by the depreciation of his property. Of course it would be the landlord's interest to reject any but a really responsible tenant: and if the provision I have suggested were adopted, it may be reasonably hoped it would lessen that unhealthy competition which often leads to tenants undertaking obligations in the shape of rent, which under the present state and prospects of agriculture they certainly cannot afford to pay."

We subjoin the prize agreement in full, in order that our readers may judge for themselves of the soundness of the strictures passed upon the different clauses, as well as form their own opinions upon its actual worth as a whole. We must candidly admit that our own impression as to the value of this accredited act and deed of the Staffordshire Society is not favourable. As we have insisted for years past, a farmer in these times can scarcely have too much liberty of action in the actual cultivation of the land he holds, provided always that due provision be made that he shall not injure the estate, and that in the case of his leaving he shall have his own again. This should be the essence of an agreement, which in other respects should be as brief and as clear as possible. There are, for instance, thousands of cases where a man might and does sell some of his straw off the farm with mutual advantage to himself and his landlord; and the notion of tenants going, cap in hand, to ask permission to sell a load of straw, should surely be exploded, instead of sanctioned by the power of a model and modern agreement. The game clause, however, too palpably points to the leasing throughout; and with this as the keystone to the fabric, the Committee, whose duty it is to amend Mr. May's handiwork, will certainly have something to do.

PRIZE AGREEMENT OF THE STAFFORDSHIRE AGRICULTURAL SOCIETY.

Copy of Agreement made the _____ day of _____ 186 ,
between A. B., of _____, Esq., of the one part, and C. D.,
of _____, Farmer, of the other part.

The said A. B. (hereafter called landlord) agrees to let, and the said C. D. (hereafter called tenant) agrees to take the farm called _____, with its appurtenances described in the schedule hereto appended, containing by admeasurement statute acres, or thereabouts, situated in the parish of _____, for one year, commencing on the 25th of March next, and thenceforth from year to year, until the tenancy shall be determined by *twelve months' notice*, subject to the following terms and conditions:—

- 1.—The rent shall be £ _____ a year, payable half-yearly.
- 2.—The landlord or his agents shall have power at all times to enter upon the premises for the purpose of getting, working, felling, and carrying away any coal, ironstone, mineral, stone, sand, gravel, marl, clay, timber, and other trees, the tenant being paid a reasonable compensation for any surface damage.
- 3.—The tenant shall not underlet any portion of the farm, nor fell or lop any trees, or grub up any fences, or plough or break up any old turf, unless by permission of landlord.
- 4.—The landlord or his agents shall have the exclusive right at all times to enter upon the land for the purpose of shooting and fishing; but if the game be let, and damage be done to the tenant's crops exceeding in any one year five per cent. on the rent, the landlord shall make compensation to the tenant to the amount of the injury done.

5.—The tenant shall have the liberty of killing rabbits in the fields from 1st November to 1st April.

6.—The tenant shall not have more than two-fifths of the arable land in wheat, nor more than three fifths in white straw crops, in any one year.

7.—All grass land mown for hay, except water meadows, shall be properly manured after each mowing.

8.—No hay, straw, manure, turnips, or manure shall be sold off the farm unless by permission of the landlord.

9.—All buildings, fences, gates, drains, &c., shall be kept and left in as good repair as they were in on entry (allowance being made for unavoidable decay), materials in the rough and paint being found by landlord.

10.—All wet ditches and water-courses shall be cleaned out yearly. If they have not been cleaned out in the year preceding the expiration of the tenancy, the cost of cleaning them shall be allowed by the tenant, and all weeds growing on the headlands and in the ditches surrounding the arable land shall be cut down in June yearly, and all thistles and nettles shall be mown, spudded, or thrashed before going to seed.

11.—All buildings and fixed machinery erected at the tenant's expense shall, on leaving the farm, be offered to the landlord or in-coming tenant at a fair valuation; if not accepted by either party, the tenant shall have the liberty of removing them, but he shall leave the premises as they were before the erection.

12.—That not later than one month before the expiration of the tenancy, the landlord or in-coming tenant (if the farm be let) and the tenant shall each appoint an arbitrator, and give notice of the same to the other party. These arbitrators shall meet not later than ten days before the expiration of the tenancy, and having appointed an umpire, shall proceed to consider the claims made by either party. In case either neglect to appoint an arbitrator as aforesaid, the arbitrator appointed by the other party shall have the same power as if he were appointed jointly by the parties.

13.—The tenant, on leaving the farm, shall plough the stubbles in a good and workmanlike manner by the 1st of February. If he fail to do so, the incoming tenant shall have liberty to enter on any day after default, and to plough and sow the land. In any case the incoming tenant may enter by the 1st of March to do his spring work, and in this, as in the preceding case, a suitable stable or shed shall be provided for the incoming tenant's horses. If the outgoing tenant do not plough the stubbles in a good and workmanlike manner, he shall not be paid for doing it.

14.—At the expiration of the tenancy, not more than one-fourth part of the arable land shall be in wheat, nor less than one-fifth in seeds sown in the preceding year. If such seeds be not properly put in on clean fallows, or if they be eaten after the 30th of September, the tenant shall not receive anything for them: otherwise he shall be paid for seed and labour.

15.—Half the value of the wheat crop, if a Michaelmas crop, and not sown after a white straw or root crop, shall be the tenant's portion; but if the average quantity of all the wheat crop exceed thirty bushels per acre, the tenant shall take all in excess of fifteen bushels, leaving that for the incoming tenant's share; but if any portion of the wheat crop be sown on foul land, the tenant shall receive only the value of seed and labour for such portion.

16.—Not more than one-fourth or less than one-fifth of the arable land shall require to be fallowed in the year after the expiration of the tenancy. If this arable land be clean and in good condition the tenant shall receive 20s. an acre from, and if foul he shall pay 20s. an acre to, the incoming tenant.

17.—The out-going tenant shall leave as battens for the use of the farm one-eighth part of the wheat-straw grown during the preceding year, for which he shall be paid consuming price; he shall also be paid such price for any oat or barley-straw, the produce of the preceding year, not exceeding one-eighth part of the crop. All the other portion of the straw shall be properly trodden down in the yards for manure. If any be left in the fields causing damage, the tenant shall pay for such damage. Any hay or clover left on the farm, not exceeding one-half of the annual average crop grown, shall be paid for at a consuming price.

18.—At the expiration of the tenancy, all manure made on

the farm shall be the property of the landlord, except as hereafter mentioned: The tenant shall be paid one-half of the cost of all purchased manures applied to root crops (except potatoes) during the last year of the tenancy, and one-fourth of that applied during the previous year, providing the cost do not exceed the average of the two preceding years. The tenant shall also be paid for all unprepared bones and lime used on the farm during the last four years of the tenancy, and for all burnt soil or marl, where the dressing of such soil or marl has not been less than eighty cubic yards to the acre; one-fourth of the cost in each case being deducted for each year's use. For every other fertiliser of a permanent character the tenant shall be paid such amount as the arbitrator may determine.

19.—The tenant shall also be paid according to the following scale for all corn, cake, or linseed, consumed by stock (except horses). If during the last two years the amount used exceed in value ten per cent. of the rent, he shall be paid one-third of the amount consumed during the last year, and one-

fourth of the amount consumed during the last year but one. If the value consumed be under ten per cent. and above five per cent., he shall be paid one-fourth of the value consumed during the last year. If the value consumed be five per cent. or under, he shall not be paid anything. Vouchers in all cases shall be produced by tenant.

20.—If the tenant has laid down during the last ten years any drains, or taken up and replanted any old fences, with the consent of the landlord in writing, he shall at the expiration of the tenancy, be repaid the amount so expended, subject to a deduction of one-tenth for each year's use. All other permanent improvements made by the tenant, with the landlord's consent in writing, shall be paid for as the arbitrator may determine.

Lastly.—The terms clean, good condition, and foul, shall be interpreted in a reasonable and practical sense, and in estimating the quantities of cropping, &c., allowance shall be made over and under for the sizes of the fields falling in the usual rotation of cropping.

MR. CHAWNER'S REJECTED AGREEMENT.

There was great excitement at the Cannock Society's meeting with respect to Lord Lichfield's prize agreement. But Mr. Collis came forward, at the request of the committee, to read the form of agreement sent for competition for Lord Lichfield's prize by Mr. R. C. Chawner. The Chairman, Mr. Harvey Wyatt, before the reading of this agreement, asked if that step was authorised by Mr. Chawner, when that gentleman's letter was read, in which he said: "I regret that a previous engagement will prevent my attendance. As, however, it was at Cannock I announced my intention of becoming a candidate for Lord Lichfield's premium for the best annual agreement between owners and occupiers of land, and as the premium has been awarded by the joint committees, I now enclose a copy of the agreement which I sent in. My object in writing this agreement was to put upon record my own views upon the subject, after an experience of more than 30 years as a tenant farmer. I place them, the agreement and explanation of its principles, entirely at your disposal." It was stated that the committee had unanimously decided that the agreement should be read; and, amidst general cries of "read," Mr. Collis read it as follows:—

July 17th, 1863.

"OWNERS AND OCCUPIERS."

AN AGREEMENT MADE THE DAY OF BETWEEN
OF STAFFORDSHIRE,
ESQ., OF THE ONE PART, AND OF THE SAME
PLACE, FARMER, OF THE OTHER PART.

The said agrees to let, and the said agrees to rent the farm described in the schedule hereto appended, situate in the said parish, and containing 420 acres, on the terms herein stated.

1.—The tenancy to be for one year from Lady-day next, and so on from year to year, so long as both parties shall please.

2.—The rent, £ a-year, payable in equal sums at Michaelmas-day and Lady-day.

3.—The tenant will also pay the tithe rent-charge, and all rates and taxes, except land tax and landlord's property tax.

4.—He will keep the farmhouse and buildings in tenable order and condition, as also all gates, fences, drains, and water-courses, and farm the land according to the rules of clean husbandry, sowing the same proportion with wheat in the last year of tenancy as if he were remaining tenant.

5.—He shall cart, free of charge, all materials for landlord's repairs, or for draining.

6.—He shall not make any alteration in the buildings, either by taking away or adding, or in the line of fences and boundaries, or in any drain or water-course, nor cut down trees or underwood, nor break up meadow or pasture, nor underlet or assign, without the consent in writing of the landlord first obtained in each case.

7.—The landlord shall be at liberty, by himself or his agents, to enter upon the farm at reasonable times, to examine the

condition thereof, and to fell timber, making compensation for damage.

8.—He shall also have power to charge dilapidations in the event of the tenant making default in the due observance of any of the provisions above stated.

9.—He will stand in the place of an in-coming tenant as regards all claims on the part of the off-going tenant, who will have no interest in the produce after the expiration of the tenancy.

10.—He will pay to the tenant when going off at the end of his tenancy for the usual tillages, and for seeds; for half the value of all manure at the current market value (whether made on the farm or purchased), applied during the last year, and for half value of all lime so applied, and full value for all hay, straw, and manure remaining unexpended on the farm, and for labour in carting and spreading clay or marl in the last three years.

11.—He will also pay to him when going off, in respect of the land cropped with wheat, provided he shall have sown the same proportion as he would have done if continuing tenant, for the seed, labour, as well as for manure before provided for, rent, and other liabilities incurred during the last half-year, and duly discharged by him.

12.—The landlord in the event of his distraining for the rent due Michaelmas shall have power to include in such distraint the rent for the current half-year, unless the tenant shall have cropped with wheat the due proportion of land, as hereinbefore stipulated.

13.—The condition of the lands, as described in the schedule hereto appended, is admitted by both parties as the basis on which two valuers as referees, one to be chosen by each, or the umpire to be chosen by them, if they disagree, shall at the end of the tenancy strike a balance between unexhausted improvements made with consent of landlord, and the dilapidations, and between allowances and rent, and thereupon award the amount to be paid in full satisfaction of all claims on either side.

[Special clause for game to be made at time of entry, when position of farm and wishes of landlord are ascertained.]
Witness their hands and seals.

FORM OF SCHEDULE.

Name of Field.	Quantity.	Crop.	Condition.
	A. R. P.		
New Piece....	19 2 0	Wheat	Clean.
Hill Field....	8 3 6	Fallow	Foul.
Church Field.	9 2 0	Pasture	Good.
Home Meadow	11 2 2	Cut for hay last season.	Aftermath mowed.
Round Hill ..	12 0 0	Turnips fed off.	Clean, and ploughed for crop.
Cottage Croft.	10 2 0	Seeds	Good, and mowed.
Clay Pit Field.	16 2 0	Beans	Well hoed and promising.

N.B.—It is not intended to suggest any particular course of husbandry by this schedule.

The explanations appended were as follow:

EXPLANATION OF THE PRINCIPLES UPON WHICH THE PROPOSED ANNUAL AGREEMENT (MARKED "OWNERS AND OCCUPIERS") IS FOUNDED.

Ancient leases, annual agreements now in use, customs of country, with their absurd and impracticable clauses, and their conflicting interpretations, have retarded the progress of agriculture, have prevented in a large degree the application of science, capital, and skill to the cultivation of the land, and have, in a word, rendered our noble profession the least progressive of all the industrial occupations in which Englishmen are engaged.

The two principal objects of this agreement are—First, to protect the landlord's interest by encouraging the application of capital and skill in the improvements of landed property; retaining for the landlord the usual power of removing a tenant who, from ignorance or disposition, fails to do his duty to the land. Secondly, to secure to the occupier a clear stage (as far as is practicable in an annual tenancy), a free field for the investment of his capital, and the exhibition of his knowledge and judgment.

To carry out these objects, in addition to the usual clauses contained in all agreements, other clauses will be necessary, viz., *the landlord will, in all cases of change of tenancy, represent and stand in the place of the in-coming tenant.*

The landlord will have the right, by himself or agents, to enter upon and examine condition of land; and to assist him in such examination, as also to protect the off-going tenant, a schedule is appended to this agreement, containing names of fields, swards, present crop, and condition of each field. A value on each part (on change of tenancy) will, with the assistance of the schedule, be enabled to strike a balance between *unexhausted improvements and dilapidations.*

The intention, therefore, of this agreement is to leave the cultivation of the land (within the conditions of the agreement) to the discretion and judgment of the tenant.

The landlord is made to stand in the place of the in-coming tenant to protect his own property upon a change of tenancy, to complete his bargain with the old tenant, and to agree, on such conditions as he may think proper, with the succeeding tenant. The landlord pays the off-going tenant, as set forth in the clauses of the agreement, for manure, &c., to ensure the continued good cultivation of the land to the end of the tenancy.

Game: A special clause, to be agreed upon at the time of entry, when the situation of the farm and requirements of the landlord are ascertained.

July 17th, 1863.

MR. COLLIS would not detain them further than to remark with reference to the protracted discussion respecting agreements, that whatever might be the form of agreement the very best security for a satisfactory relation was—if they could secure it—a good landlord and a good tenant. At the same time he quite agreed that the best possible form of agreement was one great means of securing that end, and the discussion which had taken place had no doubt done much good, and he was particularly glad to find that the landlords of this county had kindly united with a committee of tenant farmers in adjudicating on Lord Lichfield's prize, which could not but have impressed them, not only with their responsibilities as landlords, but also with the great responsibilities undertaken by those who rented and cultivated the soil.

THE CHAIRMAN said he had for a long time taken a considerable interest in the question of the future tenure of the land in this county, and he had been desirous of placing fairly before his mind the mutual obligation of landlord and tenant, and of considering what should be the nature of an agreement which would equitably adjust those obligations, and which would enable the tenant to carry out all improvements in the science and practice of agriculture. He hoped that they would believe that, though he was connected with a large territorial property—perhaps the largest in this county—that he was most anxious that ample justice should be done to the tenant. Had he not for a long period fully considered the subject, and had he not felt that his views were based on the principles he had indicated, he would not have ventured to occupy the position he did, for he knew that the question would be amply discussed there, and when he considered the eloquence of the gentleman who had occupied that position for the last three or four years, he should never have thought

of accepting the kind invitation of his friend Mr. Keeling to occupy that chair had he not felt that any personal nervousness he might feel ought to give way to a sense of public duty. He considered that the views so eloquently enforced by Mr. Chawner at the meetings of that society during the last three or four years were not practicable, or such as were at all likely to be carried out, and he did not shrink from attending there that day, though hoping that Mr. Chawner would have been in the chair, and he should have been glad to have calmly discussed the question with Mr. Chawner, who had so ably presided over the meetings for recent years. He fully acknowledged that the agricultural interests of this county were greatly indebted to Mr. Chawner, and to the discussions which had taken place at those meetings, for Mr. Chawner had promulgated opinions and created discussions, which had been of great benefit to the cause of agriculture, and for which great credit was due to him, though he (Mr. Wyatt) could not agree with some of his views, which he regarded as theoretical and impracticable, and he considered that the sort of agreement which had been read by Mr. Collis would never be adopted by the landlords or by the intelligent tenants of this country. He might shrink from announcing those views if he thought they were in opposition to the sentiments of the intelligent farmers of the district; but he knew that they shared his opinions, and that they would not approve of the agreement which had been read, and the owners of property would not let their land on such terms, and they could not get the land without their consent. What they wanted was an agreement which would fairly represent both the interests of the landlord and the tenant, which would afford ample security for the investment of that capital which it was so desirable should be invested in the land of this country, and to secure the advancement of the science and practice of agriculture. Mr. Chawner had enunciated opinions in that room which had almost electrified many people, and which had led to considerable discussion in the county at large; and no doubt it was owing to such discussions that the great landed proprietors had felt that some alteration was needed, and their earnest desire to secure a suitable form of agreement was a proof how anxious they were to do everything in their power to promote the interests of their tenants and the future tenantry of England; for the landowners not only represented their own interests, but also the interests of the incoming tenant. Mr. Chawner's views appeared to be limited to the interests of the present tenants, but he (Mr. Wyatt) did not think the present tenants objected to the restrictions which Mr. Chawner wished to sweep entirely away. Mr. Wyatt then went on to criticise Mr. Chawner's remarks at Rugeley at considerable length, the general effect being that by doing away with all restrictions he left it open to the tenant seriously to reduce the value of a farm, and the only remedy against the tenant was "dilapidations," which could only be ascertained by references, and arbitration, and expensive legal proceedings, which, in the absence of any custom of the country as a standard, would be most uncertain and difficult. In proof of this, Mr. Wyatt referred to protracted disputes between the Duke of Sutherland and some of his tenantry, which remained unsettled in the absence of any standard to which to appeal. In Lincolnshire, in Norfolk, and other counties, such a custom of the country existed, and there was something for an arbitrator to act upon, but it remained to be established in Staffordshire, and the proposed agreement, if generally adopted, would secure it.

Mr. Wyatt's remarks, of which the above are only a summary, occupied a considerable time, and the impatience of the company generally increased, until Mr. W. Masfen, sen., interposed, and urged the assembly to listen to the chairman on so important a question.

MR. WYATT then renewed his speech, but the interruption was soon renewed. He declared that Mr. Chawner's form of agreement which had been read was not worth a halfpenny, and challenged gentlemen present to say if they approved it, asking Mr. Masfen if he approved of an agreement without any restrictions? to which Masfen replied, "The fewer the better." Mr. Wyatt went on for some time to enforce his views, repeating that he gave Mr. Chawner credit for having drawn attention to a most important subject, and the result would be most beneficial, and Mr. Chawner was entitled to the thanks of the county, and to the cause of agriculture in general.

MR. R. H. MASFEN said, he was sorry that there was not

more order during the speech of their excellent chairman on the subject of agreements, as the conditions under which they had to farm, and the restrictions imposed upon them, were subjects of vital interest. It was well known that he was one of the sub-committee which had adjudicated on the prize given by their worthy Lord-Lieutenant (Lord Lichfield) for the best agreement. He need not say that to wade through the forty-seven agreements sent in involved a large amount of labour. They had, after taking the greatest care possible, awarded the prize to the one they considered the best. But nothing was perfect, as Lord Lichfield had said with reference to this agreement; and he for one did not agree with one or two clauses of Mr. May's agreement, though he decidedly thought it the best of those sent in. One of these was the requirement that a farmer should consume the whole of his hay and straw. In the locality in which he lived (near Wolverhampton) that clause would operate most injuriously, for he was satisfied that a tenant could sell a portion of hay and straw, and buy other things, which would be better both for himself and his landlord. Another point on which he did not concur with Mr. May's form of agreement was on the question of game, as it only provided that damage for game should be paid for in case it was let to a third party. That was all very well as far as it went, but it did not go far enough. He agreed as to the necessity of some restrictions in cultivation; but the fewer there were the better, for in the nineteenth century the English farmer should not be trammelled with restrictions beyond what was absolutely necessary. It was, however, necessary that the landlord should have the power of preventing a tenant from deteriorating his land. What they wanted was a standard round which they could rally, and to which they could appeal; and this would be secured by the general adoption of a fair agreement. Especially was this needed satisfactorily to adjust the claims of the outgoing and the incoming tenant, which often caused a great deal of dispute. No longer ago than last autumn, one of the greatest noblemen in the county entered an action against a going-off tenant, which, when it was heard, proved to be a most abominable thing. He did not say it was a discredit to the nobleman, who was the plaintiff; but he did say it was to whoever caused it to be taken into the court, where a verdict was given for the defendant. It was to avoid such cases that they desired a standard round which they could rally, and which he hoped would be secured as the result of Lord Lichfield's prize, and the labours of the committee who adjudicated upon it. He must express, as a member of that committee, in which he thought he should have the concurrence of several other members who sat round him, his satisfaction at the great desire shown by the landlords of that committee to give to the tenant farmers the fullest opportunity of stating their views, and the greatest deference was paid to those views. As one of the founders of the Cannock Agricultural Society, he could not but feel the greatest satisfaction that the discussions in that room had resulted in the prize so generously given by Lord Lichfield, and which fully vindicated Mr. Chawner from the censure passed upon him, of going to Cannock once a year, to preach sedition to the tenant farmers.

Mr. OSBORN said: With regard to the very important subject of tenant right, he desired to say a few words, but he spoke with a considerable degree of reserve owing to the present position of the question. Whether the committee of adjudication had acted wisely or unwisely it was not for him to say; but he must observe that the members of that committee, whether landed proprietors or tenant farmers, bestowed the utmost pains on the consideration of the question, and on every point considered the utmost freedom of remark was exhibited by both parties, and if nothing else should result from it, the recollection would always be engraven on his mind that the great landed proprietors had met the tenant farmers on equal terms, and had discussed this important question without any restraint whatever on either side, but with the fullest and freest opportunity for a full discussion of the whole subject. If no other result should follow, that could not but produce a better feeling between landlords and tenants in the county of Stafford. But he anticipated more important results, and that Lord Lichfield's prize would lead to an improvement in the relations of landlord and tenant throughout the whole country. The committee not having completed their labours, and the agreement to which they had awarded the prize not having been published, he felt a difficulty in going into the question, but he should not, when they

had the agreement fully before them, shrink from any discussion as to whether they had given the prize rightly. He believed they had given the prize to the best agreement, but he believed there was great wisdom in the suggestion of Lord Lichfield, that as this was a comparatively new question, and the committee had paid great attention to it, that it would be well for them not to separate until they had agreed upon something which they considered would be likely to be applicable to the whole of Staffordshire. He for one thought they did perfectly right not to submit such an agreement to the society until they had fully gone into the question, and had decided upon something by which they were prepared to stand or fall.

Mr. J. SIDNEY wished he could commend the management of the Staffordshire Society, as to which there were numerous complaints in reference to this much-debated question of agreements. The blame, however, in this instance did not apply to the general committee, but to the sub-committee appointed to adjudicate on the prize. He was surrounded right and left by members of that committee, and he would rather say before their faces what he had to say respecting them than say it behind their backs. No doubt that committee had taken great trouble, and the society was greatly indebted to them, but he felt that they had committed some mistakes, though those mistakes were merely errors of judgment, as he gave them the most entire credit for the best and the most upright intentions. He yielded to no man in his appreciation of the liberal conduct of the Earl of Lichfield, who had acted in this manner with an earnest desire to promote the interests of the farmer, and with a degree of liberality which was deserving of the highest praise. He blamed Lord Lichfield less for the mistakes which he thought had been made than his friends, who, from long connection with the society, must have been acquainted with its rules, and who should have pointed out the course which ought to have been pursued. The gentlemen who were appointed by the general committee to adjudicate on the agreements sent in were acting in the capacity of judges, and whether so regarded or as a sub-committee, they were equally subject by the rules of the society to the general committee, by whom they were appointed. It was distinctly understood, when that sub-committee was appointed, that the agreement which had obtained the prize should be announced at the dinner, and a great number of those who stayed did so for the purpose of hearing it read, and when that was departed from the disappointment and complaints exceeded anything he had ever known in connection with an agricultural meeting. Mr. May had come to the meeting with the agreement in his pocket, prepared to read it, and had since publicly said that its not having been read was so fatal of his. Whose fault was it? It was clearly the fault of the Agreements' Committee. The duty of that committee was clearly, after they had awarded the prize, to have reported to the general committee which met on the evening previous to the dinner, and to have obtained their opinion as to any change in the course which should be adopted, both as to reading or publishing the agreement to which the prize had been awarded, and also as to what should have been done with the other agreements. He quite appreciated the desire of the committee not to cease their labours until they had suggested a form of agreement which they thought, after so fully considering the question, was best adapted for general adoption; but that was no reason whatever why they should not at once have made the agreement public to which they had awarded the prize. It now appeared that Mr. May's agreement was to be published at some future time, without alteration; and what he could not understand was why that could not have been done, as originally intended, at the dinner. Again, with regard to the remaining forty-six agreements, his opinion was, that after the prize was awarded they should have been placed in the hands of the secretary, until the general committee met and decided what should be done with them; and he thought Lord Lichfield had fallen into an error in saying at Rugby that whoever liked to write for them might have them back. He had spoken to some of the Agreements' Committee on this point, and they stated that his lordship's statement had taken them as much by surprise as it had him (Mr. Sidney). He hoped that the course which the committee would decide to take would be to publish the whole of the agreements in a pamphlet, not opening the letters which showed from whom they emanated, but destroying them, and attaching to the agreements the names only. So, again, as to the mis-

tion of clauses from the other agreements. All he hoped the committee would do was to indicate by quoting the motto from which of the agreements the clauses they selected were derived. Mr. Sidney proceeded to defend these views by showing from the rules, that though the prize was given by Lord Lichfield, yet that it was no less one of the society's prizes, and in every way subject to its regulations. With regard to Mr. May's agreement, he must say that he thought Mr. May was a bad judge in his own cause for indicating some points in his agreement without publishing it in its entirety, as it exposed him to criticisms to which perhaps a full publication of his agreement would be an answer. As, however, he had indicated its principal provisions it was open to remark, and he would observe that he had always thought that there were three parties to an agreement—the landlord, the off-going tenant, and the in coming tenant; but Mr. May appeared to lose sight of the last. He was told that the landlord represented the in-coming tenant, and in that case, he would say that, as an occupying tenant, he would hold up both hands

for the agreement, for he must say that his friends on the committee had not forgot "our noble selves." There were, it appeared, most liberal allowances for various matters, which the landlord would have to pay, and he hoped the in-coming tenants would approve them; but he would advise them to bait the hook well, so that the in-coming tenant might swallow it whole, and not let them nibble at it, or it might not so easily go down. Mr. Sidney concluded by repeating his warm appreciation of the course Lord Lichfield had taken, whilst he could not but feel that he and the sub-committee had made a mistake.

Mr. OSBOEN, as one of the Agreements' Committee, said he must acknowledge that Mr. Sidney's observations were just, and that the prize committee should have presented their report to the general committee as soon as they had completed their award, and that the other agreements should have been entrusted to the care of the secretary, for the general committee to decide what should be done with them, with a view most to promote the benefit of the society.

THE SPEECH OF THE AUTUMN.

At a recent meeting in Norfolk Mr. W. CURRIE returned thanks as one of the successful exhibitors of roots. He said he was but a small recipient on that occasion, having made but two entries, but he thought himself fortunate in having obtained one prize. He wished to avail himself of that opportunity to say a few words upon some of the topics which had been introduced that evening—topics which so much affected their interests. He almost shrank from addressing them, as he was not able to express himself in such words as he could wish, nor was he sure that he should not say things that would be displeasing. He should, however, be extremely sorry to be discourteous to those noblemen and gentlemen who had honoured them with their presence on that occasion. He had listened with great interest and pleasure to their speeches; indeed, he held it to be one of the greatest pleasures of life to be in the company of educated and enlightened men. He presumed it to be the object of those meetings to elicit practical information, and to provoke discussion on subjects affecting the interests of their calling. During the past week or two various agricultural reports had appeared in the newspapers. Many of the speeches which had been made were clever and amusing; but he especially liked the speech of the Duc d'Aumale, with which he was much interested. But in vain had he looked for a good practical farming speech—a speech from which he could obtain a wrinkle, or which would throw any additional light upon the practice or science of agriculture. It was that which had induced him on that, as well as on other similar occasions, to presume to address them, that he might give a more practical turn to those meetings. Not that he felt qualified to throw himself into the gap; but, in looking round the room, and seeing so many men more practical than himself, he had often regretted that some of them did not more frequently give to their brother-agriculturists the benefit of their experience. One subject had been introduced there that night, which affected their interests; he meant the want of better cottage accommodation for the poor. Now they had long known, as employers of labour, that one great source of that demoralisation, of which there had been just complaints, arose from the over-crowded dwellings of the poor. In too many instances the common decencies of life were disregarded, and if the children were not actually contaminated, they were sent into the world devoid of that shame which was the natural safeguard of youth. It was in vain that they should build national schools, or that the clergy should labour at their Sunday and evening schools, while the children were subject to such pernicious influences at home. He was not echoing the press, or the sentiments of those who had written so much on the subject. He had not lived more than forty years amongst the poor without seeing the evil influences of over-crowded homes. In fact, he saw it daily from his very door. It was not for him to point out at whose door lay the duty of providing proper cottage accommodation, but had he the ability he would attempt to prove to the landed proprietors of this country

that it was a question of more importance than the mere interest of their money. What was the annual cost of crime and immorality? And where was immorality bred? But too often under the influences arising from miserable and crowded dwellings. Now a word about the turnips, which he must confess to be his great hobby. He had so often had the honour of receiving prizes in that department, and had so frequently explained his system of cultivation, that it would be a waste of time to reiterate those statements. He had, however, been beaten with his own weapons, and he should be very glad if his friend Mr. George Ives would tell them how he managed to beat him this year in growing the best swedes, that he might have the chance of beating him in return another year. He would next say a word about artificial manures. In growing mangold wurtzel, many agriculturists used superphosphate of lime with their farmyard manure. Now, as far as his experience had gone, he had not found it of much use. That plant required manure containing a great deal of ammonia, and if they could not spare twenty loads of good stable dung, there was nothing better than Peruvian guano, mixed with an equal weight of common salt. He had for many years used the superphosphate as an additional manure for swedes, but he had for the past season or two almost discontinued its use, finding it to be on the lands in his occupation most uncertain in its effects, especially during dry seasons. If a young farmer were to say to him, "How am I to grow good roots and good corn?" he should advise him to pass large quantities of artificial food with the roots through the stomachs of his fattening animals, that the manure might be of good quality. He should venture an opinion that that was the surest and cheapest way of getting a farm into good condition, especially now that beef and mutton were dear, and good foreign grain, such as maize, lentils, and other articles of the kind might be purchased at from £6 10s. to £7 per ton, which must be preferable to the so-called oilcake, too frequently made of nutcake and other cheap rubbish. He had now to ask them to give him their attention while he said a few words upon a subject seriously affecting their interests; he alluded to the malt tax, upon which both Lord Wodehouse and Mr. Howes, M.P., had spoken. They were said to live in an age of free trade, but it seemed a strange sort of free trade when he grew a bushel of barley at the cost of 4s., and before he could convert it into malt for his cattle, or brew it into beer for domestic use, he must pay into the Exchequer a further sum of 2s. 6d. or 3s. The malt tax he pronounced to be a most unjust and obnoxious impost on British produce. While gentlemen had got a reduction of duties upon their claret, their port, and other luxuries, the poor man, who earned but his 9s. or 10s. a week, and who possibly spent 2d. upon his only luxury—"his pint of beer"—has to pay almost 1d. out of that in the shape of duty. That was in truth muzzling the ox that trod out the corn. Now it was well known that Providence had blessed them this year with a good

crop of wheat, which was now selling for but little more than 1s. per stone, a price (even considering the crop), below the cost of production. It was equally well known that the crop of wheat the previous year was bad throughout the United Kingdom; it averaged about 1s. 8d. per stone, or 45s. per quarter, and that was a price below the cost of production. He was not grumbling, for he believed it to be necessary that the people of this country should be fed as cheaply as possible. But they would say, "What has the price of wheat to do with the malt tax?" He would endeavour to prove that it had a good deal to do with it, having in view their future interests. They would have seen that in years of scarcity, as well as in years of plenty, wheat had of late been selling at unremunerative prices, and they must all see there was a strong tendency to lower average rates than heretofore. Not that there was more land in the world than formerly, but every day produced greater and more rapid means of transit. Railways were penetrating into the heart of the great corn-growing countries of Europe, by which means corn was now brought to the rivers and to the ports, where huge iron vessels propelled by steam were in readiness to bring it to this country in as few days as they formerly occupied weeks. Then they had the telegraph, and not a shilling advance took place at Mark Lane but it was flashed (in almost as little time as he was telling it) to all the continental corn markets. They will also be aware that they had of late years had enormous supplies from America; and, but a short time since, he saw in the *Times* newspaper a most significant fact—that a deputation had gone from the State of Illinois to Canada to endeavour to raise a loan of some millions to cut a canal from that State to the seaboard. The deputation declared that if they had the means of transit they could supply the world with enormously larger quantities of wheat than they had previously done. That must be enough to convince them that they must look forward to a lower average price of wheat. By getting a repeal of the malt tax, he contended they would have a larger demand for barley; a much larger area of land might then be sown with that grain; and the price of second and third-rate barleys would increase. With a reduction of taxation amounting to almost 60 per cent., it was a sheer absurdity to think that the price of our best barleys would be lessened. They would thus be less dependent on their wheat crops, and be enabled to maintain their position. Before he sat down he should like to say a little about the greater sympathy which

it had been said should exist between employers and the labourers. They do sympathize with the labourers, and he declared that he was ashamed at the end of the week, positively ashamed to offer willing, able, and skilful men nine shillings for their week's labour. Lord Wodehouse, on visiting his farm the other day, had winned the old, unsightly barns in which he saw men threshing barley by hand were blown down. His lordship no doubt thought in this age of science and steam it was very strange to see his tenant using such an antiquated means of threshing as that of a man swinging a flail over his head; but without that barn there would be three or four men thrown out of work during the winter; and, notwithstanding what has been said about the decrease of the agricultural population, he was sorry to say there were several men in his parish who had nothing to do; and he thought he should be borne out by many farmers at that table in stating that they would at that moment be glad to do with fewer hands than they were now employing. It was useless under the present law of settlement to say to him, "Go and seek work elsewhere." The fact was they had in these districts a redundancy of labour, and hence the low scale of wages. Whilst there existed such a competition for land amongst tenant farmers, there would ever be a desire to keep the price of labour as low as possible. A farmer would naturally say to himself, in hiring a farm, that labour was so cheap that he could afford to give a higher rent, and thus the landowner was indirectly reaping the advantage of cheap labour. Indeed, he saw some little time since some curious statistics on that point, as showing that in all low-paid labour counties rents had risen in a greater proportion than in those counties where labour was dearer, proving that farmers were not reaping the advantage of low-priced labour, but that it was only exciting them to a fiercer competition in the hiring of farms over each other's heads, at higher rents than they could possibly pay. If it were not for the goodness of their great landed proprietors, who fixed a fair rental on their farms, they would soon be cutting each other's throats. He saw Lord Wodehouse was shaking his head, but he spoke advisedly; and he could honestly tell his lordship that if he would divide his estate into 100-acre farms, and avail himself of that accursed Scotch system of letting by tender, he would considerably increase his rents, for he would find plenty of reckless adventurers who would offer him high rents, the end of which would be total ruin to themselves and injury to his estate.

AN EVENING WELL SPENT WITH THE PENRITH AGRICULTURAL SOCIETY.

Seldom have we had the pleasure to report a more useful and practical set of speeches than the following, which were delivered in the usual course of retiring thanks, proposing toasts, &c., at the Society's dinner. Almost every topic which could be of advantage to the northern farmers was brought forward; and the advantage of Tillage v. Corn Crops—Steam v. Horse Power—Essex v. Cumberland were treated of, and placed before the guests with ability and talent. One of the members for the county first touched on practical matters thus:—

Colonel LOWTHER said: During this year he had taken great pleasure in riding about the country, he had been a great many miles over every part of it, and he could see a very great difference from what there was a few years ago. Formerly many districts near the hills used to be all ploughed, and had green crops on them, and they frequently remained green till Christmas. He had seen these converted into good pasture land, with flocks of sheep feeding upon it, a state of things which must have proved much more profitable to the farmer. If they looked at the returns of corn which came into this country, they would find that some eight or ten years ago, four million quarters of wheat were annually imported; but at the present time between eleven and twelve million quarters had been imported. Well how could the high-lying farms meet that importation of corn? This showed him that the farmers should grow beef and mutton, and they would get a good price for their wool besides. At the present time everything was to be done by

steam. In the south, every description of work was done by machinery, and it was travelling northward by degrees. He had come from Lancashire that morning, and he had seen a large concourse of people assembled to see a steam plough at work. This was no novelty to him, as they had been in use in his neighbourhood for the last three or four years. They knocked off ten or twenty acres of ploughing in no time. The steam engine was also used for other purposes, such as thrashing, &c.; and all other machinery, for reaping and so on, was in use in the south. Machinery was gradually creeping northwards, and he would not be surprised if before long he saw a steam plough at work in that neighbourhood. He was a very useful gentleman, he would plough any depth they liked to go, and would do his work in a perfect manner. He had seen a great variety of them, and he was happy to find they were coming into more general use.

Mr. MARSHALL, M.P., said (speaking of steam machinery), it was so expensive at present that it was inapplicable to this district, the farms were too small. It was very well to employ machinery which had been found to answer, but they should be extremely cautious about purchasing new implements, especially such an implement as a steam plough, in which so many improvements and alterations had been made. The steam plough could not be lifted over the stones as a common plough, and the consequence was that when it came in contact with a large stone it was liable to be broken. The land ought first to be cleared of stones, before it was safe to use it. He expected to hear some practical remarks on agriculture from

Mr. Grey, who, from his long experience, was well qualified to give them some useful hints.

Lieutenant-Colonel HASELL, the Chairman, pointed out how much better adapted this moist climate is for the production of green crops and the rearing of stock than for growing wheat. Let them have their land in good heart, and lay it down in grass, and take care to have a good breed of stock, feed them and bring them into the market: or, if their ground was not suitable for fattening them out, at all events they could bring up young stock. His impression was that wherever that could be done it was the most profitable course for the farmer to pursue. Alluding to the abolition of the corn laws, as a measure which the legislature could not have done otherwise than adopt, he said that if they looked at the *Mark Lane Express* for the returns now, they would see that for every quarter of English wheat there were two or three quarters of foreign come in, and this kept the price of wheat so low that wheat growing in this country would not be a very profitable concern. In this moist climate he urged that the most profitable plan for the farmers to adopt was to pay attention to root crops, to barley and oats, and especially to turnips and potatoes. This would enable them to keep their cattle in winter, and the foreigner could not compete with them in meat, nor could he depress the price of meat so long as the population of this country remained what it is. His advice was, "Don't plough too much; don't plough more than you can lay down well." Adverting to the statements of Mr. Mechi, at Whitehall, respecting the consumption of oilcake, he expressed doubt whether if they gave their cattle so much oilcake they could eat much grass. The farmers of this district should consider well what Mr. Mechi had said, and adopt what they thought was adapted to their circumstances, but discard what they considered to be exaggeration. To show the difference of the climate in Cumberland and Essex, he quoted a return showing that in 1862 the fall of rain at Camden Town, the nearest station to Mr. Mechi's farm in Essex, was 27 inches; whereas near Cockermouth it was 59 inches, or more than double the amount. Therefore, in this climate, rearing stock was much less risky than growing corn. The chairman next spoke of the importance of draining their land well, remarking that it was absurd to put manure into wet land, and recommended farmers to keep their lands clean, and keep their hedges well up and their ditches in good order. The great object of this society was to encourage the showing of the best animals, and to get farmers to stock their pastures with them. The short-horn, which came to maturity in two years, was a much more profitable animal than the old longhorn which took five years. In conclusion he expressed a hope that the society might long continue to flourish, and be of the same use it had been heretofore.

Mr. GRAY, of Dilton, said another important matter had been before them, viz., "draining." They were not situated as the agriculturists of the Canadas or Australia, who when they have exhausted one portion of soil can turn to another. Here in their blessed seagirt isle, though they could not increase the number of their acres, he was satisfied there were many districts in England where, though they could not extend the area, they could double the produce. By taking off the superfluous and obnoxious water, by using such manures as will bring forward the finer and more nutritious qualities of grass, they could make land carry double the quantity of stock, it had hitherto done; and upon arable land if they brought into operation twelve inches of soil instead of six, and if by the judicious application of manure they could raise a greater produce, they were not only increasing the quantity of grain, but increasing the facility for getting heavy root crops, and in this way increasing the quantity of live stock they could keep; and that, they might depend upon it, was the ground of all profitable farming in this country. Speaking of the growth of wheat, he said there were many countries in Europe where wheat could be produced in larger quantities and of much finer quality, and also at a much cheaper rate than in their own, but there was no country that could compete with them in the production of stock. In the south of England they had a climate much more suitable for the growth of corn crops, yet in the north they had the advantage of the moist climate, and could produce much heavier and more nutritious crops of turnips. In the south, sheep would not fatten on turnips without they also had oilcake and beans. But in the north they could be fattened ready for market with tur-

nips alone. He had known, in some places, of acres of turnips being given away on condition that the sheep eating them should have a certain quantity of oilcake *per diem*. Referring to steam ploughing, he said he was satisfied that it was not so applicable to this as to many other counties, tillage was too restricted, and the fields were too small. He was of opinion that the introduction of steam would increase, and probably the cost of the machinery might in a few years be so reduced as to be brought within the reach of small occupiers. A friend of his had purchased a steam plough after being at a large outlay in draining his farm, and after he had it in use a year he asked him if he was satisfied with the expenditure of £800, on such machinery. He said he was quite satisfied with the work, it covered a large space at once and left the land very clean, but the implement had been much injured by the stones, but he would take care the next time he had to plough there should be no such obstructions. He had been able to part with 14 of his horses, and the food which they consumed he could now take to market: altogether he was satisfied that he had done wisely. He (Mr. G.) thought great advantages were to accrue from the introduction of machinery upon farms. Where he lived the corn was all cut by machine, thrashed on the ground, and at once secured. This was a great advantage to cutting it with a few reapers, and, in a season like this, it was gratifying to find that most of the corn had been secured, whereas under the old system it would still have been lying upon the ground.

Mr. LANCASTER (one of the Inspectors of the farms for prizes) spoke of the rapid strides of improvement, and the necessity there was for the farmers to exert themselves in order to keep pace with the requirements of the times. He entertained a very high opinion of the farmers of Cumberland and Westmoreland, and he did not think there was a class of people better adapted to grapple with difficulties than the stalwart sons of the soil in the two sister-counties. As a proof of improvement he mentioned that he had seen at the foot of a mountain which was formerly called the "Fell of the Devil," but now the "Fell of the Cross," a most excellent crop of turnips, to which they unanimously awarded the first prize. The crops of the other competitors were very good, and proved that they were no strangers to the utility of oilcake. He next alluded to the differences between farming in the north and south, particularly in the price of labour; for instance, a man farming 500 acres of land in the north would pay nearly £200 a year more in wages than an occupier of the same quantity in the south. He would ask is it true that the labourer of the south had to sit down upon a stone at meal times with a crust of bread in one hand, and an onion in the other, to destroy the cravings of the inner man? Is it true that the cottager has to support a wife and family out of the miserable pittance of nine shillings a week? If this was the case he envied not the farmers of the south their large balance-sheets, but with the blessing of Almighty God upon their efforts, they were determined to give a fair day's wage for a fair day's work.

The CHAIRMAN made some observations upon the steam plough, which he had seen upon a farm. He took some pains to examine it, and he also asked the farmer how he thought it profitable. It seemed that the implement ploughed six acres in the day, and inasmuch as it took two horses and one plough a day to plough an acre, it followed that the steam plough would do as much work as twelve horses. The cost of the machine was £800, and when he asked the farmer (who occupied 1,000 acres) if it paid him, he answered that he believed it hardly would, if employed on his own land only. It was of the most advantage on clay land, when soft, as it prevented the treading of horses and left it very clean, but he purposed, when he became better acquainted with it, to hire it to other farmers, and so he thought it would pay very well. He told him, however, that it did not answer upon stony land, and as some of the land in Cumberland was very stony, the plough would be very liable to be damaged. There was some land in the county upon which a steam plough might be used with very good results. A number of farmers might join in the expense and use it jointly, but Mr. Grey had observed that the plough might be chequered and adapted to small farms, and it would be as well for them to wait a while.

Professor HARKNESS said although he was not at present in the position of a farmer, he could appreciate what farmers were doing. When he said he was not a farmer, he did not say that he had no interest in farming, as he had an interest

in it, in common with all mankind as consumers of what farmers produced. He was afraid that were he to enter into the history of agriculture, he should cut but a sorry figure; but having seen, as he had done, farming in almost every portion of the British Isles, he might be allowed to express an opinion and offer a few remarks. Agriculture had been called a science; therefore, in the first place, it was necessary that those practising it should have a true knowledge of the science upon which they profess to work. Mr. Mechi has told you that by doing certain things he gets a quantity of produce; but he does not tell you why he does so. It had been mentioned by Colonel Lowther and Mr. Grey, that draining was a great fundamental principle of agriculture; but a scientific man would go further than that, and give the reasons why he was capable of appreciating such a course. For instance, a man knows that by draining land he destroys the rushes and the useless plants (to a farmer) which live and thrive upon wet land. But when he destroys the bad he increases the good, and by making ten blades of grass grow where only one grew before, he not only puts money into his pocket, but he does more—he ameliorates the condition of the climate in which we live, and by so doing he lengthens human life, and becomes a benefit to society, by mending the condition and increasing the productive powers of the land which he cultivates. They were all aware that since the introduction of agricultural chemistry, many great changes had taken place: they had been made acquainted with the properties of certain manures, they knew that the application of salt and soot would produce good crops on clay land (especially of wheat), for a time, but its ultimate effect would be to render the land sterile for many years. Ammonia, if applied in large quantities to soil, would make it

positively barren; but it was well known that these things possessed fertilizing qualities, and were very beneficial, when judicious use was made of them. Plants were destined either for the food of cattle or of man. If given to cattle, the ultimate object was the production of human food. Now there were two important matters which they had to take into consideration. It was necessary to produce bone as well as flesh, and they knew that farmyard manure only contained it to a very small extent; and, therefore, it was necessary that other manures containing it to a greater extent, should be employed. Wherever they wanted to produce bone they must have phosphate of lime. This was contained to a great degree in ground bones, and the common mode of application was after dissolution in sulphuric acid. Thus they found a process going on by which bones could be made available for the nutriment of plants. But there was another important chemical required in the production of cereals, and the framework which was to support them. The questions arose, how could they produce a large quantity of phosphate, how could they give it to the soil, and how could it be furnished to the plants? They must apply it in the form of silicate of potash. If they used a large quantity of guano, they might, for a year or two, have very fertile and luxuriant crops; but the result would be, as Liebig had shown, a spoliation system. They had not only to give the plant what it required, but they had to give it in a scientific manner. He believed that a large application of bones and phosphate of lime would be advantageous to the soil, and these substances could be rendered applicable to plants by the addition of small quantities of ammonia, in one form or other. He fully believed that knowledge was power to the agriculturist as well as any other individual.

CAUSES OF FERTILITY AND BARRENNESS IN SOILS.

Fertility understands a power or faculty of production from any seeds that may be used for the purpose of continuing a progeny; and the further extension of the word designates a quantity of increase that exceeds the general ratio of production. *Barrenness* means a total want of the faculty of production; or, more generally, a meagre quantity of increase in comparison with similar sources of yielding a progeny from the seeds of the respective organisations. In the latter sense—of a larger and smaller comparative produce—the terms of *fertility* and *barrenness* will now be used.

Soil means the surface land that is used for the purpose of cultivation, and for producing crops from the seeds that are deposited in its matrix. Large and small quantities of these crops are obtained according to the constitution of the soil in elemental substances, the quantity that is present of the articles, and the ratio in which they are mixed and blended together. The nature of the subsoil, or under-stratum, is, in many cases, of very considerable moment in the fertility of the land that lies upon it—if it be wet or dry, porous or compact. And then the climate, or external influences to which the vegetables of the crop are exposed in the growing and maturing condition; and, lastly, the capacity of the soil for imbibing and retaining moisture and caloric.

Soils are very largely varied in the composition, but mostly derived from the decompositions of the rock on which they repose. There are several extraneous bodies intermingled with the soil, which have been produced and located by unknown causes; and there are vast depositions of imported debris lying between the rocks and the soil, which seem to destroy the direct connection between the parents and the progeny. This interposition is mostly local, and may be reckoned a diluvium from peculiar causes, and in a certain position.

Soil is the support of vegetation, and the reservoir of receiving and communicating nourishment. This power is large or small, according to the composition of the soil in the natural ingredients, and the mixture of the substances and the contingencies of aspect and exposure. These latter circumstances are frequently able to overturn the power of the natural qualities, and to confer properties which the original constitution does not possess. The chief substances in soils are clay, sand, lime, animal and vegetable matters, some oxide of iron, and occasionally certain saline compounds. The three ingredients

of clay, sand, and lime, are the principal constituents of soils, along with the valuable addition of animal and vegetable matters, now called *humus*. Clay is a viscous earth, of marine or fresh-water origin, ductile and plastic, capable of retaining the moulded forms, imbibes fifteen times its own weight of water without dropping, and retains it with great obstinacy. A very considerable quantity of clay is necessary in the composition of soils; it is the basis of all good lands; there cannot be a rich-bearing earth without it; conveying a vast chemical superiority, though with a mechanical disadvantage. Clay is required to imbibe and retain moisture, of which the performance, in the proper quantity and degree, constitutes the value of its presence. An excess of clay produces a starved barrenness from too much moisture: the want of it forms weak lands, dry, and barren.

Sand is the particled granulation of rocky substances that have been reduced by the action of water, and have been carried about and located by the aqueous agitations. The quartz and siliceous formation prevents any cohesion of sand, which is loose and incoherent; and when dried, it is blown by the wind. It possesses not any fertility, but is usefully mixed with other substances, and, in the proper quantity, promotes the openness of soils that is necessary to fertility.

Lime is an earth from marine putrescence, with a large attachment of carbonic acid gas. The nature is very favourable to organized life; and the substance is found in most situations where its presence is required. It is very largely diffused, in consistence and in solution, and forms a grand support of life. Previous to the appearance of lime as a constituent substance of the globe, it would appear that no animal had lived, and that as it increases, life of every kind becomes numerous and prolific.

The decomposed remains of animal and vegetable matter now called "*humus*" may exist in a fibrous condition or in a state of fine, impalpable powder, that is blended with the natural earthy substances. It is a vast acquisition to the cause of fertility; and in most cases the quantity and quality of it, beyond any other ingredient, constitute the distinguishing characteristic of lands, for the purposes of producing crops.

The traces of oxide of iron found in soils are in a quantity scarcely appreciable for any purpose of fertility. The ratio

varies from two to ten per cent., and the substance is mostly wanting. It exerts much influence in the soils of iron sand that lies below the gault clay, forming the lower bed of the third or quartz sand there, which overlies the oolite, and supports the chalk. Being heated by the early summer suns, the soil is too hot, and the crop is scorched, and dies or becomes very unproductive. In an arable condition, the land is liable to be battered into hardness in any working of the soil, after rain has fallen. These soils are not many, and are much modified. The oxide is the same with the rust produced by exposing iron to the action of air and water; is most abundant in yellow and red clays, and in yellow and red siliceous sands.

The saline compounds are of as little effect as oxides in forming the character of soils, though they have been discerned and recorded, but hardly estimated. They are principally muriate of soda or common salt; sulphate of magnesia, or Epsom salt; muriate and sulphate of potash; nitrate of lime; and the mild alkalis. Manganese, or the oxide of manganese, has been noticed in soils, and known by the property it has of decomposing muriatic acid, and converting it into another substance.

The matters which constitute soils are of a compound nature, and operate as such in the formation of them. There are few, if any, substances in Nature which, after being exposed to, and acted upon by, the atmosphere and other agents, are not capable of affording support to some kind of vegetables, though there is a very great variety in this respect among earthy matters. Some matters are very quickly converted into the proper nourishment of vegetation; while others require a long time in being assimilated into a material for sustaining any kind of vegetable life.

The proper materials of soils are clay, sand, lime, and animal and vegetable matter, of which the proportions differ largely. A good turnip soil has been found to contain:

Carbonate of lime	..	..	63
Silica	..	..	15
Alumina	..	..	11
Oxide of iron	..	..	3
Vegetable and saline matter	..	..	5
Moisture	..	..	3

100

A good wheat soil contained:

Carbonate of lime	..	..	28
Silica	..	..	32
Alumina	..	..	29
Animal and vegetable matter, with moisture	..	..	11

100

A very productive soil contained eight parts of finely-divided earthy matter, and one part of siliceous sand. The former gave:

360 parts of carbonate of lime,	
25 parts of alumina,	
20 parts of silica,	
8 parts of oxide of iron,	
19 parts of vegetable, animal, and saline matter.	

Three-fifths of fine sand and two-fifths of impalpable matter have been found in rich soils: the latter consisted of

Alumina	35
Silica	41
Carbonate of lime	14
Oxide of iron	3
Vegetable, animal, and saline matter	7

100

Five-sixths of fine siliceous sand have been found in good soils, and one-sixths of fine palpable matter, which contained

Alumina	41
Silica	42
Carbonate of lime	4
Oxide of iron	5
Animal, vegetable, and saline matter	8

100

One-eleventh of coarse siliceous sand has been found in good soils, the finely-divided matter of which consisted of

Alumina	7
Silica	14
Carbonate of lime	63
Oxide of iron	2
Vegetable, animal, and saline matter	14

100

In all these cases the fertility seems to depend on the state of division and mixture of the earthy materials with the animal and vegetable matters; the quantity of clay indicating the more cohesive texture, and the sand that of openness and a light cohesion; the exuvial matter always showing the general fertility. In the most fertile soils the sand and clay are nearly equal in quantity, the latter being rather the preponderating ingredient, and the decomposed organic matter the agent of influence in fixing the quality of the soil.

The mixed matters in soils being present, derived from the rocks on which they rest, or from some drifted alluvial debris, or local diluvial beds, the ratio of the quantity in which the substances exist, and the mode or manner in which they are incorporated, or blended together, exerts a primary, or probably the chief influence in conferring fertility on soils. The number of ingredients has much effect, and also that the nature is different, and various, and contrary to each other in the constituent materials. The alluvial formations constitute the best natural soils, which have been produced from strata of different kinds, and formed in a gradual manner from the deposition of rivers and other waters, which have been the most perfectly divided in their parts by the operation of air and water, and are the most intimately blended and incorporated together: they are in most cases very fertile. The number of ingredients must be attended with the ratio to each other: the predominance of unfavourable substances will confer an unfruitful quality, and a balance of the more benign qualities will fix a productive character of soil. Then the mode or manner in which the matters are mixed together—whether the blending is done in the most minute and impalpable condition of insensible distances, and thus forming a chemical combination; or being deposited in separate bodies or layers, that constitute a mechanical aggregation. This circumstance has a most powerful effect. In the former, the action of particle upon particle is produced, and all the influence of molecular attraction: the latter affords only the inert exertion of detached bodies that lie in masses under the affinity of aggregation. The attraction of cohesion only happens in which the bodies retain the qualities they possessed before they were joined—affinity of composition, the great agent in the operations of Nature and of art, is not produced; and the new combinations, being directly as the surfaces that are presented, and inversely on their masses, do not happen, as the efficacy of composition is inversely on the attraction of cohesion. Accordingly, the mechanical action of culture in moving the soil will increase the tendency, and promote the direction of the reciprocal affinity of minutely and intimately blended substances: manures will find some body with which to act, and exert a mutual influence. On soils of few ingredients that lie in separate masses, a manure may be repelled, or find no affinity, and is lost, or very partially developed in its use. Hence the fertility of soils from a number of heterogeneous ingredients that are very minutely and intimately incorporated and chemically combined, and the barrenness from a paucity of ingredients that are the same in nature, and distantly commingled. This fact is proved by the daily example of alluvial soils, loams, earths, moulds, lacustrine and fluvial deposits, and in every operation of water, which is necessary to produce a heterogeneous affinity; and the union results from the reciprocal action of the molecules of the bodies on each other. In these intimate mixtures, manures find a ready opportunity of action, and the fertility of produce is certain. These alluvial soils of loams, earths, and moulds possess the invaluable quality of admitting an easy pulverisation and reduction of texture into a fineness of tilth that suits the minute seeds of cultivated plants, retaining at the same time an equable portion of moisture, and admitting the action of caloric; and when the land is laid into repose from cultivation, by being planted with a crop, the cohesion of particle again happens, which induces the mutual action, and produces the combination of a

reciprocal affinity. This inestimable property arises from the presence of a number of varied and opposite ingredients, the ratio, and the mode, or manner, of the commingled mass.

In regard to the general constitution and composition of fertile soils, the first essential requisite is, that it contain a sufficient quantity of the three or four simple earths above mentioned, and of the soluble carbonaceous principle; and then, as has been just stated, the ratio of the ingredients to each other, and the mode, or manner, in which they are blended together.

The depth of soils in the aerified and humidified stratum of cultivation has much influence in conferring the quality of value on the soil, as quantity in very many instances produces a capacity that did not exist in the materials when present in a small number. The subsoil, or under-stratum, which supports the cultivable layer, if it be earthy or rocky, compact or porous, influences the productiveness of soils. A sandy soil may owe its fertility to the power of the subsoil to retain water; and a wet, clayey soil may be much benefited by a subsoil of porous sand or gravel. It is well known that soils constituted of the most suitable substances for the purposes of vegetation, when only a few inches in depth, and deposited on beds of cold, wet clay, rock, or chalk, are by no means so fruitful and productive as those which are deeper, though of inferior quality, but resting on a bottom which is dry and gravelly. The difference of weight and tenacity in the understrata of soils likewise introduces great variety in regard to their powers of raising and rearing vegetable productions in the way of crops upon them.

The variations in the weight of soils are very material, as they show in some measure the quantities of animal and vegetable matter with which they are impregnated in different cases, the lighter sorts being in most instances the most abundant in such substances. An extreme lightness, however, denotes an absence of proper earths, without which the exuvial matter fails to exert the proper influence.

The fertility of soils is very much influenced by the power of the earthy mixture to imbibe and retain moisture and caloric. On these two properties the value of lands depends in a very large degree. Clay absorbs fifteen times its own weight of water without dropping, and retains it with great obstinacy. Sand absorbs only one-fourth of its own weight, and evaporates three times faster than clay. Lime absorbs about one-third of its volume of water. The exuvial matter, or the decomposed remains of animals and vegetables forming the impalpable powder of moulds and fine earths, imbibes moisture gradually and slowly, retains it equally, and parts with it in a way that affords a moderated nutriment to plants, and without an excess or a total want. This latter property arises from the very minute blending of the materials of composition, and from the ratio of the presence of the ingredients. The particular manner or method in which moisture is distributed through or combined with the earthy and the other materials is of great consequence and importance, in so far as relates to the nourishment of plants that grow upon the lands that support the growth. Where the water is too strongly attracted by the earths, it may not be absorbed in the due quantity by the roots of plants; where it is present in too great a quantity, or too loosely united with the earths, it will tend to injure or destroy the roots of plants. Moisture exists in two states in the earths, and in animal and vegetable substances—in a chemical combination, and by cohesive attraction. The earthy matters do not appear to hold water in chemical combination; for water is expelled from earths by most substances that combine with them. Saline substances will hold water in both ways, but the very inconsiderable quantity cannot materially influence the relations of soils to water.

The power or capability of the soil to absorb and receive water in consequence of this sort of attraction depends greatly upon the state of division of its parts; as the finer and more minute this is, the greater and more powerful is the capacity for absorption. The different constituent parts of soils likewise seem to operate even by this kind of attraction with different degrees of force and energy. Vegetable substances are more absorbent than animal substances; animal matters exceed the compounds of clay and sand; and these latter are more absorbent than the carbonates of lime and magnesia. These differences may depend on the states of division, and on the surface which is exposed.

Fertility in relation to moisture in soils will be produced when the excess of water retained by the clay is corrected by the small quantity held by sand, and these modified by the more proper quantity held by calcareous substances, and all regulated by the equable proportion absorbed and given off by the exuvial remains of organised life. Barrenness arises from the predominance of clay, and in the small quantity received and retained by sand, and from the absence of humus and of calcareous matters.

A condition of fertility depends on the power or capability of soils to absorb water from the air. For this purpose, the loose and light mixtures that are permeable to the atmosphere consist in the finely-blended composition before mentioned: the chief quality resting with lime, and the animal and vegetable matters. These substances confer the absorbent power, and do not destroy tenacity: sand destroys tenacity, and affords little power of absorption. The capability of absorption is always greatest in the most fertile soils, and constitutes one mode of judging of the productiveness of land.

The earthy parts of the soil retain the water, supply it to the roots of plants, and are in this way efficacious in producing the proper distribution of the animal and vegetable matter. These soluble parts are supplied in the due proportions or quantities, and when the water is equally blended and intermixed, the too rapid decomposition is prevented of the exuvial matters. Clay and lime form the best matrix for manures and vegetation, as nourishment is long preserved in them, unless carried or taken up by the organs of plants. In sands, the little soluble matter, not being held by earths, is carried away by water, or speedily decomposed by the atmosphere. In soils of vegetable moulds the earths are in combination with the extractive matters afforded during the decomposition of the vegetables, which is slowly attracted from the earths by water, and constitutes a prime cause of the fertility of soils. By this process the food of plants is equally supplied, and never deranged by excess, or a hurtful diminution.

The capability or power of cultivated earths to imbibe and retain caloric, or the source of heat, constitutes a cause of fertility that exerts an influence which is very probably next in degree to the presence and proper blending of the necessary ingredients. The essential importance of heat or warmth to the existence of organised life, is so well known as to require no argument or demonstration to establish the position. The fact is incontrovertible, and furnishes a ready basis on which to build a superstructure. Without heat, a proper distribution of it, and an equable temperature of its effects, organised life does not live and prosper. An excess, and the want of it, are equally hurtful, and exhibit the great necessity of a medium quantity of its power. On its action the effects of manures very much depend.

Clay is the lowest in the scale of conductors of heat, being 11.4, and gold at 1,000. It possesses the anomalous quality of contracting by heat, while other bodies expand; and these two properties concur in rendering an unmixed clay a barren soil. Sand, in the crystallized particles of siliceous composition, receives and radiates heat very quickly. The rapid warming of the particles is followed by as quick a cooling, and neither caloric nor moisture is retained in any useful quantity. Lime and calcareous substances possess double the power of clay in conducting heat, and become very useful ingredients in soils, for that special purpose. The animal and vegetable matters in a wholly decomposed state or in a moderated condition enjoy a still greater power, and divide the capacity of imbibing and retaining caloric with the capability of absorbing and retaining moisture. In this point, as in every other case of the composition of soils, the value altogether depends on the proportion of the ingredients that are present, and on the mode, or manner, in which the finely-commingled blending of the matters is effected. It has been ascertained that dark-coloured, dry soils which contain abundance of animal matters, and are soft in the texture, acquire the highest temperature, and also the carbonaceous and ferruginous soils, and that the heat is more equally parted with than by other soils which are devoid of these mixtures. Earthy matters alone do not imbibe heat so quickly nor cool so fast as when mixed with exuvial remains.

The genial heat of the soil is of the greatest and most material use and importance to the raising of plants as crops

When the leaves are fully and widely expanded and developed, the ground or land is considerably shaded, which prevents any injurious consequence from the overheating during summer; so that the temperature of the surface, when bare and exposed to the effects of the sun, affords at least one indication of the fertility of the soil, and the thermometer may, therefore, be sometimes a very useful instrument to the purchaser as well as improver of lands.

The quantity of rain that falls on land exerts an influence on the fertility, and in relation with the altitude of the situation, its aspect, and the nature of the soil itself. The fall of rain may be stated to range from 20 to 40 inches; and within these extremes the quantities will be found suitable for sandy soils, and the lands that contain a medium portion of clay and calcareous matters. Much rain requires porous sands, to allow the speedy evaporation of the large quantity that falls; and dry climates require that the soils are fitted to retain the moisture for future use. If the clayey constitution of a soil predominates, the land will retain much moisture, and become too cold and starved. The light soils will evaporate quickly, and retain too little moisture for use, while the mixed soils will imbibe freely, and retain equally. Consequently, the average fall of rain in any district or locality will confer a degree of fertility or barrenness, according to the constitution of the soil, and becomes a fixed principle in judging the value of lands.

The position of lands in the climate of altitude above sea-level, and in equatorial distance, exerts a very large influence on the fertility of the soil—if the locality be cold or warm, wet or dry, frozen or mild in the atmospheric influences. The equatorial differences are the chief regulation of climates; but very large modifications are made by collateral circumstances, as by a high or low situation, the nature of the soil, the extent of the continent, the vicinity of mountains, forests, marshes, lakes, and seas, and from the direction of the winds. These contingencies chiefly form the climate, without which soil and cultivation will avail little. The elevation of lands above sea-level is the chief distinction to be regarded in respect of fertility or barrenness of soils, the coldness of the position allowing or prohibiting the successful growth of cultivated plants. This affection will wholly destroy any good quality of soil that may accidentally exist. The growth of plants may be vigorously pushed forward, but the maturation of fruits is prohibited, and in a regular scale of descent from a total barrenness to the low position of fertility, varying in every step of declination from cold to warmth in the equable medium. These degrees of declination exert a constant and unceasing influence that is altogether beyond any control, at least in any considerable extent.

Next to position, the aspect and exposure of lands will in a considerable degree, in many places, influence the fertility of the soil. The lands looking to an unbegrudging or favourable quarter of the heavens, will promote or retard the growth and maturation of crops, as the aspect to the east, south, and west, in being warm and benign, or exposed to the north-west, north, and north-east, and consequently cold, boisterous, and stormy. Aspect follows position in giving favour or hindrance to vegetation. Their influence is very great in many places, and wholly regulate the standard of fertility, in disregard of the natural constitution of the soil, which can only fix the roots and forward the growth of plants that are unfruitful by reason of the external influences.

The fertility of lands is considerably influenced by the exhalations which rise from the surface of the ground, in the quantity and quality. An exhalation is an emission, fume, or vapour, which is drawn by the rays of the sun from watery or moistened bodies, which form clouds, and sometimes assume the appearance of meteors. The terms "evaporation" and "exhalation" are often used indifferently; but accuracy has now distinguished the appropriations, in giving to evaporation the moist fumes raised from water and other liquid bodies, and to exhalation the dry fumes emitted by solid bodies, as earths, rocks, and minerals. In this sense, exhalations are dry and subtle corpuscles or effluvia, loosened from hard terrestrial bodies either by the heat of the sun or the action of the air, or some other cause, being emitted upwards to a certain height in the atmosphere, where, mixing with vapours, they help to constitute clouds, and return back in dews, mists, and rains. From the surfaces of

collections of water and of grounds that are surcharged with moisture, as clays and swamps, the vapours, or evaporation, arise watery and cold, and are unfavourable—even hurtful—to vegetation. The quantity of water overpowers the being warmed by the sun, and the coldness prevails. From dry bodies, and from grounds that are mediately contained in moisture, the exhalations are emitted in a warm and comparatively dry condition; the water is mastered by the heat of the sun and warmth of the ground, and the emissions are favourable to vegetation. When the vapours return in rains and mists, the quantity in the first case is extreme and hurtful; in the second case the fall is moderate, and beneficial. On light soils of all denominations that contain too small a quantity of moisture the fumes are quickly expended by the heat of the sun, and benefits are not derived by a continued exhalation. The altitude of position and the aspect of lands will determine the quality of exhalations—warm on low grounds, cold on high localities, genial from warm aspects, and unbenign from cold exposures. The quantity and quality of exhalations are dependent on the circumstances of formation and position of the ground, and being a fixed attendant the consideration requires a constant notice in the estimation of soils. They cannot be formed without the necessary sources, which must be seen to exist, that fertility may be completed.

Richness and fertility are to be distinguished in any treatment of soils. The former term implies the presence of a great quantity of humus or organic remains, whether already prepared or not, for the nutriment of plants; fruitfulness comprehends a ready preparation of humus, or in a soluble state, for the support of vegetation. Humus is a form of organic power, and differs, as it is formed from animal or vegetable bodies, but certain general peculiarities or properties always confer a distinguishing likeness. It doubles its weight by absorbing water, and 100 parts have been found to retain 190 parts of water, and loses it very gradually. The power of humus to retain warmth has been fixed at 0.49, and at 0.72 it has little cohesive power. The proportions of humus impart the fertile or barren property to soils, and act by presenting a slow and lasting source of carbonic acid to the roots of plants, which is provided by the carbon and oxygen forming the acid gas by the solubility in water. Salts exist in humus, and humic acid is a noxious ingredient. It is not every decayed substance that is humus, and not every species of humus is in a condition for the fertility of plants; but a rule may be fixed, that fertile soils contain the most humus and much easily-dissolved humic acid, while unfruitful and barren soils contain little humus, and from which few or scarcely any other bodies than siliceous earth are withdrawn by water. To the essential presence of humus to constitute fertility must be joined a varied and heterogeneous assemblage of matters opposite in nature, and in a very minute reduction—the ratio in which they are present, and the mode or manner in which they are combined. And then the effects of climate, which are often so powerful as to overbalance the constitutional quality, and in many cases to correct constitutional defects. The variation of these influences is equally great with the composition of the soil, and the two combinations render fertility and barrenness of soils to depend on a number of affections and contingencies.

SIR JOSEPH PAXTON ON THE DERBY FARMS.

—At the Bakewell Club dinner, Sir Joseph said: I maintain that we have very good land in this part of the country, and can feed beasts as well as any part of her Majesty's dominions. I believe I may say that one of the greatest difficulties we have to contend with in this county is the great variety of land which has to be dealt with. It is quite a different thing in Norfolk and Leicester, where they have nothing to do but plough the land, sow and till according to a fixed rotation, and depend upon the seasons. Here we are dependent upon a variety of circumstances requiring great ingenuity on the part of the man who means to make a livelihood out of farming, in adopting the best system of carrying out his operations. I have been connected with the county nearly forty years, and have taken a great interest in everything connected with the rearing of animals and plants; and, as the results of my

long experience, I have come to the conclusion that one of the most important things for a Derbyshire farmer to attend to is to take care that he keeps his animals warm, particularly in the winter. I concur in the advice given at a meeting here, in the early existence of this club, by a much respected member of Parliament, who was not only a politician but a farmer, and the author of some good articles on draining. He said he got it into his head that shorthorns would do in the High Peak, and he put some out to pasture on the high lands. It was so cold in the winter that they set their backs up, and they could never be got to straighten them again. Whether a farmer in the Peak district pastures, in the high or the low lands, it is a great point to attend to the warmth of his stock. Another

point is, never to break up any good grass land if he can avoid it. I know some land in this district (I won't mention the name of person or place) which was broken up so long ago as the great revolutionary war in France, when corn was selling at fabulous prices, and it has never got round. It was broken up to get corn; but the growth of corn is quite a speculation. It cannot be grown here more than once in two years; and it is not worth cultivation in such districts as this. I know you must plough a little land in order to get straw for your farmyards; but I strongly advise you, as a farmer myself, and as a man who has had the management of a very large property, and taken great interest in this matter for a long period, to break up as little land as possible in this district.

GOOD EDUCATION AS CAPITAL FOR A FARMER.

At the Halberton Society's Meeting the Reverend Canon GIRDLESTONE delivered an excellent address in giving the toast of the evening. After a happy introduction, in which he attributed his own rise in life to education solely, he said to the farmers particularly: "My object on the present occasion is to show you that a good education is capital which will do for the farmer, that it is the most valuable kind of capital that he could possibly possess. I shall endeavour to point out to you one or two respects in which it must be patent to all that education is a valuable capital to the farmer. First of all then, the educated farmer will be able to understand and appreciate, a great deal better than the uneducated farmer, what I may call the science of agriculture; and depend upon it, my friends, that if agricultural pursuits are to be carried on successfully, if the farmers connected with the various agricultural associations are to compete not only with the farmers of other counties in England, but also with the farmers of the continent, they must, in these days of scientific interest, take up the study of agriculture as a science. Take this illustration—the more a farmer is educated the more he will appreciate what I may call the improvement of stock. And no one, I feel confident, knows better than our excellent vice-chairman, Mr. Webber, how beneficial to the farmer is the improvement of stock. The educated farmer again will understand how that sewage—which, till within the last few years, has been considered nothing but waste—may be made a mine of wealth by being used in the fertilising of the soil; he will more liberally employ artificial manures, the more carefully select his seeds; he will know much on the subject of drainage—which is a very important subject in itself; he will urge upon landlords the importance of having larger inclosures, and to take down their hedgerows and hedgerow timbers, so as to give God's sun and air free course to fertilize and cultivate the soil. The educated farmer, I repeat, will be able to understand and appreciate all these matters, a vast deal better than the farmer who has not been educated. Another point of importance is that your educated farmer will be able to understand and appreciate more thoroughly the use of improved agricultural implements, the improvements effected since the introduction into this country of the drill, the thrashing machine, the steam plough, and the mowing machine. The introduction of these improved appliances of art created riots nearly the same as those when James Hargreaves brought the "spinning jenny" to the aid of cotton manufacture, and when the 'power loom' was introduced into the manufacturing districts. In the present day, I suppose, there is scarcely any part of England in which the old 'flail' is used by our farmers, except for special purposes. It has been rapidly superseded, and is now almost banished before the thrashing machine. We find also the tedious process of sickle reaping, and other means of agriculture, formerly in use, have gradually given place to the use of improved instruments, and one cannot fail to observe that improvements are still being effected. As an instance, I observe that in many places the steam plough is being substituted for the implement which we saw so skillfully used in the meadow this morning. And depend upon it, the more educated the farmer is, the more ready will he be to adopt what must in the end inevitably be adopted, the use of improved agricultural implements. Depend upon it, the time

has come, or is not far distant, when a great number of the implements which we use, and amongst them what we saw this morning—when those very ploughs which we saw so skillfully used to-day will not be seen anywhere, except as historical relics in some of the museums in our large towns. But you will say, How can we afford these things? Why there is not so much difficulty about affording them, as you might at first be led to imagine. As I myself witnessed, during my residence in Gloucestershire, it is a matter of perfect ease for farmers of districts to club together, in order to become possessed of expensive implements; and more than that, it is one of the inevitable actions of political economy, that where there is a demand, there is sure to be a supply. But once let the farmers determine to use expensive and improved instruments of agriculture, and depend upon it parties will soon step forward to supply them for hire. Now another way in which education is capital to the farmer is this—it will lead him to see the fallacy of supposing that there is any antagonism between the agricultural and the manufacturing districts. Perhaps nothing ever led more thoroughly to this conclusion than the distress which overspread the manufacturing districts last year. And it was pleasing to me to hear and to see how the agriculturists of this district—and this parish, I am proud to say, was not the least amongst the rest—deeply sympathized with, and to their utmost contributed to the relief of that distress. It was gratifying indeed to read of the kind and sympathetic feeling which existed between the agricultural and the manufacturing districts, and the promptitude with which assistance in the time of need was rendered. I repeat that there was never such a fallacy as to suppose that there is anything like antagonism between the manufacturers and the agriculturists—the only antagonism which ought to exist is this, that we agriculturists, on whom the manufacturers are so dependent, should take an example from the enterprise by which manufacture has, up to the present period, been developed and distinguished. Depend upon it that land is a much better material to work upon than cotton. There never was such an honest servant as land: whatever you lay out in its cultivation it always makes a return to you with interest; and we cannot always say that of cotton. It has been very well said, and is a good axiom, that agriculture tends to the prosperity of the whole human race, and forms the riches both of commerce as well as of states. Therefore, my friends, I say that education is no bad thing if it opens, as it does, a man's mind, if it enlarge a man's ideas, and if it lead him to see that so far from antagonism there ought to be a strict alliance between one kind of interest (the agricultural) and the other (the commercial). There is a still further point in which education is a capital to the farmer, and that is that an educated farmer will have more sympathy with, and will endeavour more thoroughly to improve the habits and character of the labourer whom he employs. I believe that, gentlemen, is one of the inevitable results of education upon the minds of the farmer. Now mind you, I do not speak in either a religious or even in a moral sense. I am speaking simply in a political and social sense. And I think I need not tell you that a great deal of the prospects of a farmer depends upon the fact whether the servants employed by that farmer are honest, sober, industrious, clever, and intelligent. All I can say is that if ever I

want a servant I always look out for one bearing the best character; and, gentlemen, I think a farmer would find that his interest lies in the same direction; therefore, as a mere matter of self-interest, it is of the greatest possible importance that farmers should do their utmost to improve the status and condition of their labourers. Depend upon it, my friends, that this matter is of the greatest importance to you, and I shall not be stepping out of my way by inviting you all to sympathise with your labourers in their trials, in their illnesses, and in their afflictions. If any of you should at any time happen to have a cow ill, or a sheep ill, you don't think it too much trouble to sit up all night and attend to it, administering any amount of medicine that it may require. And, gentlemen, the least that we can expect is that you should do the same for the labourers whom you employ, and depend upon it they will by attention to your affairs make you a return with compound interest. This is a matter not merely of religion or morality, not merely of social science, not merely of sympathy, but my belief is that it is a matter for your own pockets. Another point I think, and perhaps you will smile at me when I say so, in which education is capital to a farmer—and now I shall have a good laugh; but never mind; I am pretty courageous, having been laughed at on many occasions before this during my life—is that our educated farmer will be able to choose a better wife than our uneducated farmer will. I do not know what experience you may have had in the matter of wives, but I have the blessing of possessing a very good one, and my little farm prospers extremely well with so good a helpmate. Depend upon it, gentlemen, that a good wife is no small amount of capital upon

the farm. Holy Scripture says that her price is above rubies, and I believe it to the very fullest extent of the term. I don't mean a wife who thinks nothing but about dress and finery, a wife that has nothing to show but a pretty face—though a pretty face in its proper place is a very good thing to have in a wife—but God makes the pretty face, and I don't see why we should not be thankful for all His gifts. An uneducated man is captivated solely by a pretty face, while the educated man seeks for a thrifty and 'canny' woman, who, not only when he gets his money will save it for him, but also knows how to make good use of it when necessary—a wife whose sole desires are not concentrated in adopting the latest extravagance in fashion, whose chief hobby is not her turban hat, whose hoops do not cut capers on the floor to such an extent that every door of the farmhouse becomes doubly as narrow as it was before. I say I believe that I have the heart of everyone with me when I affirm that a good wife is capital, and therefore that education which leads a man to choose a good wife is capital. Drawing to a conclusion, there is just one more point, and only one, on which I will speak about capital to a farmer. It is something more serious than I have yet touched upon. I believe that education will lead a farmer to look for and pray for God's blessing upon all his agricultural occupations; he will know that however great be his skill, however great be his industry, one single premature frost, or one shower more than sufficient of rain, sent by God, will at once frustrate anything that either his skill or industry can effect; and by education he will be led to see that all is futile, unless God prospers what he does."

AGRICULTURAL STATISTICS.

At the Chertsey Agricultural Society, Mr. W. S. LINDSEY, M.P., said: Upon another subject connected with agriculture he could speak from his knowledge as a commercial man, and that was as to the necessity of having agricultural statistics. In 1846 or 1847 he, as a broker, engaged tonnage to bring to this country no less than 1,200,000 qrs. of corn. Other brokers of course did the same, but he then felt it to be uncertain whether that quantity of grain was actually required. At that time France was buying corn largely in our markets at from 46s. to 50s., and the farmers and holders of corn were selling at those prices. Nine months afterwards the people of this country were paying 102s. per qr. for corn. France, by reason of the statistics taken in that country, knew the quantity of corn likely to be required from abroad, while we were in utter ignorance as to the quantity we had actually grown. In consequence, France had a great advantage over us, and for three or four months the people of England were paying £1,500,000 per month for grain from abroad. In 1846-7 we had to send abroad large amounts of gold to pay for grain. A panic followed, and a fearful crisis occurred; some of the largest houses failed, and very many farmers lost large sums of money, because, in our ignorance of our real stock, we had sold to France for 46s. to 50s. the corn we had afterwards to replace at 100s. to 102s. (Hear, hear). The people suffered and the farmers suffered, because no one class could suffer without all other classes in some degree also suffering (Hear, hear). As it was with individuals, so it was with nations, when one suffered so did the other. America was now passing through a fearful ordeal, and England was suffering, too, to a great extent from the calamities of the American people (Hear, hear). It was the interest certainly of England to see all other nations prosperous and happy. Twenty million quarters of corn required 3,000,000 of registered tonnage or 4,000,000 tons burden of shipping to import it. They could easily perceive how that would affect the price of other articles of import by creating a scarcity of tonnage, and enhancing the price of cotton and other raw materials upon which our manufacturers and artisans depended. The price of these manufactured articles advanced, and thus all classes were affected. He would therefore suggest to his agricultural friends to consider calmly whether the collection of agricultural statistics would not be an advantage to them as well as to other classes of the community.

Mr. BRISCON promised to give his best consideration to the subject of agricultural statistics whenever it should be brought forward in Parliament, but would not at present give any decided opinion, as he should wish to know what were the opinions of the farmers of Surrey, after hearing the able arguments of his hon. friend and others.

Mr. CAIRD, M.P., said he had long been acquainted with the character of the English farmers, and always found them ready to give a friendly reception, even when he made enquiries which they considered would be as well omitted. The subject of agricultural statistics was one to which he had devoted much attention, and it could not be put in a fairer way than it had been put by the Chairman, as a commercial man. He would speak to those present as a farmer to farmers. It had been said that the question was a corn merchant's or corn dealer's question, and not a farmer's question; but he would ask them, were not the far greater number of corn dealers also farmers? There were about 500,000 farmers in Great Britain and only about 5,000 or 6,000 corn merchants; and, therefore, surely if anybody was interested in obtaining correct information it was the farmer. The only advantage they could hope to have over the foreign grower was their proximity to the market; and if they had early information of the state of the market they would have the benefit of that advantage. He was glad to believe, from the friendly manner in which the Chairman's remarks had been received, that in that part of the country no insuperable objection existed to a system of statistics that would not be inquisitorial. The right hon. member for Oxfordshire, Mr. Henley, who justly enjoyed the confidence of the agriculturists, had put it that the farmers would not object to answer certain enquiries, but would object that the cost of making such enquiries should be exclusively borne by them. That was a reasonable objection, and no man could say that the farmer should be exclusively taxed for a proceeding that was intended to be for the equal benefit of all classes. He knew of no other country where agriculture had improved more than in this country. Our agricultural shows, our stock shows, our displays of implements and machinery, proved that. He would just make a few remarks upon the late abundant harvest, that they might realise what was the meaning of those words. Taking one quarter per acre as the average excess of the crops of this year, which he believed was a moderate estimate, and adding for the additional weight

and better quality of the grain two bushels per acre, there would be ten bushels per acre above the average. They had certain facts, although but partial information, upon which they could calculate the breadth of land under grain cultivation. He found that something like 12 million acres of land in the United Kingdom were used for the growth of corn; 10 bushels excess per acre upon the breadth of land gave a total excess of quantity above an average crop of 15 millions of quarters. From those facts his hearers could realize the meaning of an abundant harvest, which gave them an excess, valued at present rates, at £21,000,000. He had referred to all kinds of grain; but, confining himself to wheat, how did the case stand? He had been surprised to see in a usually well-informed newspaper, the *Spectator*, so low an estimate of the annual produce of wheat as 6½ million quarters a year. He believed it was nearly 12 million quarters. The excess of crop this year would be about 8,500,000 quarters, and as the average consumption in this country was 20 million quarters, it followed that we should have to import not more than 2½ million quarters in the present year. Not hav-

ing the figures before him, he could not speak precisely, but he believed that last year we bought abroad about 10 million quarters, at a cost of £25,000,000, while this year we should only have to buy 2,000,000 quarters, at a cost of £5,000,000, thus effecting a saving to the country in the single article of wheat of 20 millions sterling. They knew also as farmers that it was not their business to depend exclusively upon the produce of their cornfields, but rather to increase their green crops, with which the foreigner could not so well or so cheaply supply them. Referring to Arthur Young's account of prices in 1770, he found that bread was then 1½d. per lb., the same as it is now. Meat was then 3d. per lb., now from 7d. to 8d.; butter which was 6d. is now 1s. 3d.; and wool has risen in value 6d. to 1s. 6d. per lb. Therefore the conclusion was that the land yielded the same in bread as in Arthur Young's time; but it now yielded more than twice as much in meat and three times as much in wool. It was therefore not doubtful that the farmers would devote their energies to those branches of their trade which were likely to be the most remunerative.

STEAM: EDUCATED LABOURERS: STATISTICS AND THE MALT DUTY.

At the East Surrey Meeting the chairman, Mr. W. G. LAYTON GOWEN, M.P., said: Every one must regard with satisfaction the rapid advance of steam cultivation throughout various parts of the country, because it was destined to meet the demands of the former in two most important respects—first, in the point of economy, and secondly in that of efficiency. The great difficulty which the farmers had now to meet, were the low prices of corn, and the extravagant price of labour, and these steam cultivation was destined to meet and put the farmer in a better position than he now occupied. It might be asked, "Do you think a farmer can afford to keep a steam cultivator?" and to this he would answer "No;" but he believed that in course of time, when the system was generally introduced, societies would be established in various districts for the letting of steam cultivators, and that they might get their land ploughed eight or ten inches deep at a reasonable rate—say 10s. or 12s. an acre; thus, great advantage would result to agriculturists from this improved system. With respect to the question of improved dwellings for the labouring population, he might state that he had watched the subject with great interest, and had read the letters in the leading journals, which were well worthy the attention of all of them. His friend, Mr. Beynon, had so ably alluded to the subject that it was unnecessary for him (the chairman) to add more than a few observations. He believed that many of the statements put forward had reference to isolated districts, and that if they were now to take a drive through the country they would find that a marked improvement had taken place in the dwellings of the labourers within the last ten years. The labourers themselves were much better cared for than they had ever been before, and the status of that class was higher here than in any other country of Europe. Now, there was no doubt that the introduction of steam as applied to agriculture would effect a great change in their labourers—that it would lead to the formation of a class of skilled labourers. But where were they to be found? They must be produced by greater attention being paid to their education, their wants, and their comforts, and by these means the condition of the labourers would be much improved. But if the education of the labourer was better attended to, it was also necessary that the education of the middle classes should be improved. When he last had the pleasure of addressing them he adverted to the extraordinary low price of corn, and pointed that out as one of the great difficulties with which the farmers had to contend; those low prices continued; but if he could prophesy a rise he would certainly do so, but he was afraid he could not. When they saw the large imports, and the extensively increasing foreign acreage under cultivation, he did not think the price of corn would improve unless a famine were to occur. This was a question to which they ought to direct their attention, as it was quite plain that they could not grow wheat profitably, if the present expense of cultivation was to be continued. He had advocated the laying down of more grass,

and increasing the green crops, as he believed that the price of stock would keep up and be more profitable than corn. It was quite clear that the foreigner could not compete with them in the production of meat; they had also an enormous and increasing meat consuming population, requiring food at their hands, and therefore it was worthy of consideration to the farmer whether he should not relinquish a portion of his corn, and increase the amount of stock upon his land. He wished for one moment to refer to the importance of agricultural statistics. He did not wish every farmer to tell what profit he got out of his land every year, but he thought government should be made acquainted with the number of acres under wheat, barley, oats, and green crops in the country, and it was also important that the farmer should have access to information of this kind for his own guidance in estimating future prices. England was the only country in which agricultural statistics were not kept, and he hoped that they would shortly be kept here. There was also another question in which the farmers had much interest, and that was the malt duty. His hon. friend on the left (Mr. Alcock) was a strenuous advocate of the abolition of the malt tax, and he agreed with him in his opinion upon the matter, because this duty was opposed to the principles of free trade, and was the cause of a great deal of cheating and demoralization. But he (the chairman) thought the most important fact in favour of the abolition was that malt was very valuable in the feeding of cattle. He was sorry that the deputation which waited on the Chancellor of the Exchequer had not been successful, but the right hon. gentleman was no farmer, and entertained a different opinion as to the necessity of repealing the duty. Against the views of the Chancellor he would set those of Mr. Fisher Hobbs, a well-known practical agriculturist, who stated that persons competing for prizes, or for exhibition, found it necessary to feed their stock on malt, and that during the last thirty years, when he made up his mind to show and win a prize, he had used malt, which was far superior to oil-cake. Dr. Voelcker had expressed similar opinions; indeed, everything went to show the importance of malt as a food for cattle, and he trusted that some alteration would take place in the duty, or that it would be altogether remitted. The subject had been brought before the House of Commons, and many members had been most active in the cause, particularly the members for Sussex, and it was to be hoped that ere long something would be done as in the Hop Duty Repeal agitation, that there would be unity on the part of the farmers, and that they would make up their minds that the abolition was worth fighting for in good earnest.

Mr. ALCOCK, M.P., said: Several interesting and important subjects had been brought to their notice that evening, and one of the most important he conceived was with respect to agricultural statistics. He was surprised that such an important question should have met with such a strenuous opposition. The system of agricultural statistics was first introduced

into France in the year 1800, on the suggestion of an Englishman—Arthur Young; and about one hundred years ago, namely, about the year 1750, it was first proposed that a census of the population should be taken in England. This proposition met with great opposition, and the advocates of that measure did not succeed in carrying it into effect till 1800, the very year in which the French adopted agricultural statistics. In France the operation of this system had been found to be very beneficial to agriculture, and it was a great disgrace to this country that the only means of ascertaining the quantity of corn grown was by means of the number of leaves consumed—the knowledge that six or eight bushels of bread were consumed per head leading them to conclude that about 5,000,000 acres were under wheat cultivation. But, to take a lesson from the French, they knew positively that the vineyards of France occupied quite as much land as the wheat of this country. These statistics were obtained in France by means of the police, but he did not think the attempt to obtain them here in that way would be found to work satisfactorily. If they were to be obtained, proper persons should be appointed for the purpose, and paid for the performance of that duty. He believed that in a short time the opinion of the country generally would be that these statistics were highly desirable things for all parties; indeed, it had been stated in parliament, with much show of reason, that the farmers themselves were the most to suffer from the want of statistics, because they did not know what they were about. How could they expect to effect any great progress in agriculture unless they had the same statistics to know how they were going on? The malt duty was then referred to by the hon. gentleman, who stated that while in the year 1772 a barrel of beer was considered to be the average consumption per head, for several years now, the annual consumption per head had not been more than 20 gallons, which change was doubtless in a great degree attributable to the operation of the malt duty. It was rather a curious fact that the consumption of wine in France was also 20 gallons a head, corresponding exactly with the quantity of beer consumed per head in this country; but what would be the result if the French Chancellor endeavoured to raise £5,000,000 exchequer upon the beverage of the people there? Why, a rebellion would be the result if he endeavoured to raise even one-fourth of that sum. They might depend upon it that it was impossible that they could get rid of the malt tax; they would have to submit to it for

many years until they rose up in a state of indignation and excitement, when they would doubtless soon get rid of it. Some farmers grew as many as 300 or 400 acres of barley, for which they had to pay about £1,500 or £5 an acre, and he would ask them were they going to stand this for ever, or were they going to make a move and a stir and have a good row? He thought that was what it must come to. The Rev. Mr. Beynon had alluded to the subject of improving the dwellings of the labourers, which was a very important and complicated question; but he was of opinion that the law of settlement ought to be abolished, and that, if it were, a beneficial effect would result; he felt that a man should have the liberty of going wherever he chose, and that he should be supported by whatever parish he was found destitute in. A few years ago it was proposed that the law of settlement should be abolished, but it was not carried out because it enacted that when a person applied for relief and stated that he was an Irishman he would have to be sent back, while North-countrymen and Scotchmen were to be protected and supported. This was manifestly unfair, and that was the only reason it was not abolished two years ago. He advocated that each parish should support every destitute man found in it, whoever he was and from wherever he came.

Mr. E. STANNING, the Vice-chairman, said: He was very glad to see so many county gentlemen among them upon that occasion, but he was very sorry to have to differ with any of them on any point whatever, but he certainly did with regard to the desirability of agricultural statistics, from which he believed in practice no advantage would be derived, nor did he believe that they could be effectually carried out. He considered it very unfair that a farmer should be called upon to state how many acres he had under wheat cultivation, as he might have sown more than was in strict accordance with his lease, and therefore he would be, as it were, convicting himself. He then referred to the necessity which existed for the repeal of the malt tax, and stated that the result of his experience was that malt was most valuable in the feeding of stock. In the year 1860, being a maltster himself, he was one of those who were privileged enough to obtain drawback on a quantity of inferior malt, and with this he fed his stock, and the effects it produced were very great. He only hoped that the farmers will endeavour to assist their members of Parliament in the agitation for the repeal of this tax, in the most strenuous manner.

A FARMER ON FARMERS.

At the recent Blofield Meeting, Mr. Clare Sewall Read, who responded to the toast of "The Tenant Farmers," said: "The farmers had been told more than once lately that when they met together in a body they should not compliment and praise themselves. He considered such a course would not only be very bad taste, but was also most unjustifiable and even ridiculous. Take the tenant farmers individually, he thought they would be found average specimens of humanity, and might be even jolly good fellows; but taken as a body, they were the most helpless, pitiable, and stupid race of men in the kingdom (Great laughter). They had yet to learn, as a body, that self-preservation was the first law of nature; and if there was any truth in the old saying, that 'united we stand, but divided we fall,' then the agricultural interest had not stood on its feet since he could remember (cheers). And it appeared to him that they were in Norfolk getting from bad to worse in this matter; their farmers' clubs had ceased to exist; their market ordinaries had dwindled almost to nothing; and if it were not for their autumnal meetings, there would be no chance for the tenant farmers to say a word for themselves. Late as it was, we should therefore embrace the opportunity of reviewing some of the events that had affected their interests during the last twelve months. They naturally first looked to Parliament. Out of the 200 or 300 Bills that had passed the session not more than one or two particularly interested the farmer. The legislature had, in its wisdom, passed one bill that was undoubtedly meant to protect the farmers against themselves. He referred to the Poisoned Grain Act. Although many of them had no doubt found poisoned grain very useful in destroying mice and other vermin about their houses and premises, yet its improper and careless use had very properly

brought about its prohibition. But if the farmers of England went to Parliament and said, 'in consequence of the careless and improper use of lucifer matches, many thousands of pounds value of our property, and of the food of the people, are annually destroyed, do pray impose a good tax upon these matches, and so make it worth while to take care,' then would they not be laughed at, or called an unreasonable, stupid, and selfish set of fellows? ('Hear, hear,' and great cheering). Now he (Mr. Read) was quite ready to admit that the wholesale poisoning of small birds was both wanton and cruel, but he was equally certain that the wholesale preservation of all the feathered tribe would be very injurious to the farmers. There were certain birds that lived almost exclusively on insects, and there were others whose habits were just the reverse, for they lived almost entirely on grain. The sparrow was essentially a granivorous bird (cheers). Notwithstanding all that naturalists might say, he had proved that by dearly-bought experience, and when he was a boy he had shot sparrows in every week of the year, and had purposely examined their crops, and never did he find insects, save for about a month or so in the early summer when there was no corn to be had (Hear, hear). Therefore, his advice was, to do all they could in preserving rooks, starlings, swallows, and such like birds, but by all means to keep the sparrows within reasonable bounds (cheers). But it appeared to him that this bill was not only framed for the preservation of birds, but that it was also passed for the protection of rats (a laugh). They all knew how they swarmed this year in their fields, and he contended that the only way to effectually destroy rats in the hedge-rows was by poison (Hear, hear). What did they all do? Why, they placed the feed and afterwards the poisoned

meal in ditches, in the banks, and the mouths of the rats' holes. But had they any idea that by so doing they were liable to pay a little fine of only £10? (A voice—"Hope not.") He hoped not also, but the act clearly made them liable, for it said that any person who should "knowingly lay, put, or place upon any ground or other exposed place," any poisoned meal, was liable to a fine not exceeding £10. But if the farmers had this little evil inflicted on them, they had the satisfaction of knowing that they had escaped, for a time at least, a still greater evil, in the withdrawal of the bill for "the prevention of contagious diseases among cattle and sheep." The bill proposed to establish an Inspector-General of Stock, and that he should have under him certain local inspectors, whose duty it should be to visit all the fairs and markets in the kingdom, and prohibit the sale of any stock that showed signs of any contagious disorder. Now these gentlemen might go to Norwich Hill to-morrow and prohibit the sale of half the stock, for he was sure that the greater part of the cattle showed there would exhibit the first symptoms of the foot-and-mouth disease. And the duty of these inspectors would not rest there; they would be empowered to visit infected districts and put them under quarantine; would be further authorised to kill and destroy the carcasses of cattle suffering from pleuro-pneumonia, and also slaughter any other stock that they considered infected with the disease. Now, he (Mr. Read) firmly believed that if this bill passed, and was carried into effect, not only would the value of beef be soon double its present high price, but he felt equally certain that the diseases under which their stock now suffered would not be exterminated. During his short residence at Plumstead he had suffered greatly from pleuro-pneumonia, and twice during that short time he had cleared himself of all his cattle, working oxen, cows, and all, and thoroughly cleaned his yard and stalls, and yet last autumn two bullocks out of two separate lots were attacked with this fatal lung-disease; but though he had then nearly a hundred head of cattle on his farm, he had no more of it till the spring, when it again visited his fat stock. He had no reason, therefore, to believe in the efficacy of the several measures that were proposed, and feared that they would only prove a loss to the nation, and be the ruin of a great many farmers. On another subject he must briefly allude to—he must say a few words

upon the subject of agricultural statistics. Some gentlemen might fancy this a threadbare subject, and certainly since the proposal to employ the police it had become more than ever unpopular. He was not going to detain them much longer or trouble them with his own views on the subject, but this he must say, that if agricultural statistics were to be of the slightest use, they must be strictly accurate. It was just ten years ago since the first attempt at these returns was made in Norfolk; they of Blofield Hundred were then not perhaps exactly sulky, they did not perhaps even set up their backs, but at any rate they were so very busy with their own business, that they had not much time to spare for these returns. But their brethren in the Ayleham Union were more docile; they to a man responded to the call of the learned Commissioner, and made a complete set of returns. It was in the highly-favoured district that the Commissioner thought they might venture at a few calculations of the value of the agricultural property comprised in the union. Now that union contained in round numbers just 60,000 acres, and the value of the produce of the land and the live stock was estimated at the sum of £1,500,000, and the dead stock (the implements) at a further sum of £900,000, which made a total of £2,400,000, or just £40 an acre. (Great laughter.) He was sure that the wildest guesses of practical men had never been so far wrong as this calculation based on these agricultural statistics. But he had a special reason for bringing this glaring error under their notice. A few years ago he had the honour to write a short account of the improvements in Norfolk farming for the Royal Agricultural Society, and he, in his innocence, fancying that these calculations, which were published under the authority of Parliament, and based on these perfect statistics, could not be otherwise than correct, adopted them for the whole county, and so made an exaggeration that has only been equalled by the romantic tale which Mr. Alderman Mechi told the Cumberland farmers about the Castlereagh cake and manure bills. (Great laughter.) He owed a humble apology to the public for having made this great and stupid blunder, and he also owed them an apology for the length of his speech, and he thanked them most sincerely for the patience and attention with which they had listened to his long and rambling remarks.

STATISTICS, MALT, AND MACHINERY.

At the Manchester and Liverpool Meeting, the Honourable W. EMBERTON, M.P., who presided, said the farmers had been most willing to take advantage of the experiments made by a few gentlemen of capital and enterprise. Farmers were no longer satisfied with the old system of careless farming, allowing the ground to be covered with weeds, and using a few simple inefficient implements to till it. Such associations as that whose anniversary they were celebrating stood on very high ground. Associations like that which recently met at Newcastle had done much for commerce and manufactures; associations like theirs had done as much for agriculture. It might or might not matter to Birkenhead whether there would be a sufficient supply of coal 200 years hence; but it was of present importance to Birkenhead that food should be obtainable in the cheapest and best manner possible. That was the object of their Society—to increase and cheapen the supply of food; and it was no idle aim. The Government had lately brought forward the question of agricultural statistics. It was important that there should be a thorough knowledge of what was grown, and of the amount of stock in the country. An attempt to get such statistics in Ireland has been attended with considerable success. There they have been obtained through the constabulary. He believed that there would be an objection in England to the collection of such statistics by the constabulary or by the overseers. It would be better to get them in some such way as in Scotland, where they were obtained by the Highland Agricultural Society. However, if they might be got, it must be by the voluntary efforts of the farmers. There must be nothing like compulsion. All scientific farmers would acknowledge how very useful the compilation of such statistics would be. Such a compilation was made with respect to manufacturers and commerce, and there was no reason why it should not also be made with respect to agriculture. Mr. Bass, the great brewer, found it worth while for his own business purposes to ascertain how much barley

was grown in the year. This reminded him that last year he accompanied a deputation of farmers to an interview with the Chancellor of the Exchequer to ask him to reduce the duties on malt. It was stated on that occasion by excellent agriculturists that the value of malted barley for feeding purposes was very great, and that it was only the duty which prevented a number of animals being fattened on it. If that was really so, this was a subject which agricultural societies might well take up, in order to press upon the Chancellor of the Exchequer the reduction of the duty. He believed that if the case was properly put before that gentleman, he would reduce the duty on the first opportunity. He believed that there was no county in England better suited to raise and fatten cattle than Cheshire. Its admirable grass and moist climate were very great advantages. Even should the Cheshire cheese, which had a world-wide reputation, be beaten out of the market by the American cheese—of the goodness of which he did not pretend to judge—it would be a profitable undertaking for the farmers to turn to the raising of stock for fattening. There were other subjects which might profitably occupy the attention of their society. Among them was the improvement of the status of the agricultural labourer. Farmers could do much to improve the condition of agricultural labourers, by employing the children upon half-time, and using their influence to procure the sending of the children to a school during the time they were not at work. There could be no doubt but that with the continuous adaptation of machinery to agricultural purposes, workmen more skilled than the present generation would be required. It would be impossible to obtain them unless the children now were properly educated. There was also the subject of labourers' cottages, with respect to which there was room for much improvement in the ventilation, the drainage, and the division of the rooms. This was a matter to which the society might well give its attention.

ARE PIGS PROFITABLE STOCK?

The subject for discussion at the late meeting of the Croydon Farmers' Club was introduced by Mr. WILSON, who said: As the object of my paper will be the attempt to show that pigs are profitable, I must give you my reasons for thinking so. Last winter I attended a discussion at the Meratham Farmers' Club, which was opened by Mr. George Harrison, of Chipstead, who read a very able paper on the subject; and the conclusions he drew from it were—that, on a farm where there are means of making manure by bullocks or sheep, pigs are profitable if they pay for the food they consume, as they make a quantity of valuable manure, and will pay much better than bullocks. No doubt, the profit of pig-keeping depends in a great measure upon having a good breed, and on the management of them; but, as you, gentlemen, now around me know a great deal more on this part of the subject than I do, I will not lengthen my paper by introducing my ideas to you; but, in justice to Mr. Harrison, I will mention that he recommends a cross between the Berkshire and Chichester for making pork to any weight, as he has always found them hardy, and good doers. He also recommends that all pigs, except breeding sows, should be kept in a thriving state from the time they are weaned; and he prefers commencing with coarse middlings, and mix gradually with barley or pea-meal, according to the strength of the pigs. Mr. Harrison objects to feeding breeding sows on mangolds. At the discussion in question, there was one point considered and fully debated, to which I particularly request your attention—namely, whether it is most profitable to sell the pigs you rear as stores, or fatten them for porkers, or bacon hogs; when it was decided that they paid best in selling as stores. I hope some of the gentlemen present will favour us with their opinions on this point. In an article on high farming read by the late Mr. Baker, before the London Farmers' Club, some years since, that gentleman says: "A bushel of barley or peas has always been considered as equivalent to the production of 8 lbs. of meat. Therefore, if the price of meat is less per stone than the grain per bushel, the difference is a loss, and *vice versa*." Now, if I can show from others and my own experience that pigs do pay for the food they consume, and leave a small balance besides, I think it will be admitted that they are a profitable stock to keep. In "Morton's Farmers' Almanack" for 1868 it is stated that some experiments were tried at Mr. Lawes' farm, Rothamsted, with sixteen pigs, to test the value of "Condiment Food;" but as we have not met to go into that question, I will extract from that article what pertains to the subject now under discussion:—

	£	s.	d.
Lot 1.—Four pigs bought in at 41s. 6d. each....	8	6	0
Consumed 2,650 lbs. of barley, at 37s. 6d. per qr.			
of 416 lbs., including grinding.....	11	18	10½

	20	4	10½
99 stone 8 lbs. of pork sold at 4s. 4d. per stone,			
sinking the offal	21	10	7½

Profit.....	£1	5	9
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By this experiment, I am borne out in my view that pigs may be kept to advantage, as it is shown that the farmer obtained a good price for his barley, and the pork was sold at a low price. I may here mention that in another of these experiments, when the pigs were fed with barley-meal and bran, they realised no profit whatever, thus showing that, in fattening, bran is disadvantageous. When I commenced farming, in December, 1857, I had one pig, valued to me at £1 10s. In May, 1859, by purchases and breeding, the number had increased to 77, at a cost of £35 2s. 6d. At the latter date, I had sold all out for £183 4s. 5d., thus leaving a balance of £104 1s. 11d. for their keep. I then commenced again with two sows, and, in twelve months, I bred from them 89 pigs, and purchased 14, making together 55. In the succeeding twelve months, I lost four by death, and sold the remaining 51 for £100 8s. 11d., thus leaving £85 17s. 11d. for their keep. Now, this appeared to be very satisfactory; but, as I

had not kept an account of the cost of the food consumed, I could place no reliance on the result; therefore, after that time, I entered against the pigs the cost of all they consumed, and I will now state to you my profit-and-loss account:—

	£	s.	d.
May, 1860, two sows in pig (produced 16 pigs)	8	0	0
Cost of food and grinding	24	6	7
Profit	7	17	9

	£40	4	4
November, 1860, sold 16 fat pigs.....	28	4	4
Two sows and their second farrow (19)	12	0	0

	£40	4	4
November, 1860, to April, 1862.	£	s.	d.
Bred and purchased 99 pigs at a cost of....	36	18	0
Cost of food with grinding.....	104	4	9
Profit	10	13	0

	£151	15	9
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April, 1862.			
By sale of 89 pigs to date.....	£151	15	9
Died 10			

Now, I admit that this profit of £10 13s., extending over a period of nearly eighteen months is not large; but you will bear in mind that the oats, barley, and peas consumed were my own growth, and charged to the pigs as follows—viz., oats, 27s.; barley, 36s.; and peas, 42s. per quarter. Pollard and middlings at the miller's charge.

	£	s.	d.
From April 25 to Dec. 31, 1862, I had and purchased 30 pigs, at a cost of	11	6	6
Cost of food and grinding	15	13	11

	27	0	6
30 pigs sold as stores and fat for.....	29	3	0

Profit.....	£2	2	7
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Since which time I have not struck a balance. I have made no charge for attendance, as I consider the manure made a sufficient set-off against it. To my thinking, pigs possess an advantage over other animals kept on a farm, in this respect—that you sooner get a return of the capital originally invested in them. For instance, suppose you commence with a sow and eight pigs, and that you give £6 for them, you will not have to keep them long before you can sell the pigs for the same amount, and have the sow left to fatten or breed from, as you please. Out of twenty-four farrows that I have had, I find the average number reared has been eight and a-half. Gentlemen, as my desire has been to ventilate the question, and not exhaust it, I will now conclude, hoping that you will freely state what your experience has been on this subject, not only as regards whether pigs are a profitable stock or not, but whether it is most profitable to dispose of them as stores, or to fatten them. And as I have not written this paper for my own gratification, but to oblige our worthy secretary (who must have issued his card short one subject for discussion if I had not responded to his request), I trust you will not look upon it with a too critical eye; and if I have not stated anything worth your coming here to listen to, I have the satisfaction of knowing that if the gentlemen that usually attend our meetings are present, and will express their opinions on this subject, they will fully make up for my shortcomings, and compensate you for the trouble you have taken in coming to this meeting.

Dr. POWELL said he had turned his attention to the management of pigs for some time. He had one year 100 pigs. When he was in Aylesbury he saw a number of young ducks that were nailed by the web of the foot to keep them from waddling about, and for the purpose of fattening, and he found out that in seven or eight weeks they were as large and as nice ducks as any person's. It then occurred to him that if

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pigs were confined whether they would not thrive better on the same amount of food than they would if they were allowed to wander about. For this purpose he confined some of his pigs and put chains about their necks, which they did not like at first, but they got used to it, and he found that the pigs got on better by being confined than they did by roaming about. He found that those in the small styre were better than those in the large one, and those in the large styre better than those that had their liberty. Pigs, he considered, were profitable stock to farmers. A friend of his was carrying on an experiment, which was this:—He had three pigs, and he weighed all their food, and every week he weighed the pigs regularly, and he found that for every half-hundred weight of food he gave them that they gained 14lbs. of flesh. He mostly fed them upon rice; but whether upon rice or barley meal he found that for every half-hundred he gave them they gained 14lbs. of flesh. He had also found that by reducing the quantity of food, so he reduced the increase of flesh, and as he increased the quantity of food, so in proportion he increased their flesh. There was a vast difference in the way in which pigs were kept. If they kept pigs in straw yards they would always find that the pigs buried themselves beneath the straw. In proportion as they kept the pigs warm, so in proportion would the pigs thrive. The pig was generally a neglected animal, and had often to seek for its food. He considered pigs ought to be given something more than what they could pick up, and the advantage of doing so would be apparent to the farmer. Pigs' dung, as it possessed such a large amount of nitrogen, he thought could be diluted with water before it was used as manure, and a better animal to work in a straw yard they could not find, for it had more nitrogen and consequently made manure faster than other animals, and, as it had been said, the pig was absolutely a profit to the farmer.

Mr. ASHBY said fourteen years ago he commenced pig-keeping and pig-breeding, and he bought two pigs of a man, and he thought that they were very nice pigs, but he could not see anything of a hog in his neighbourhood fit for them. At last, he was one day at The Arrow, at Chesham, and he asked the man if he knew of any one having such a pig as he wanted, and the man said he had just such a pig by him, and would sell it to him. He (Mr. Ashby) said he did not want to buy; but after seeing the pig, he bought and took it home, and after a time both his pigs proved in farrow. The young pigs were very pretty pigs, and he sold several of them, keeping some back. He sold one to Mr. Carter some little time before the Agricultural Show, and the pig was killed, and after it was killed, he would have given him £5 for it, as it was the handsomest pig he ever saw, and the head of the pig was still to be seen at Mr. Carter's. As for the young pig meat, he would say that it was very sweet, but he must say that by keeping old hams they got sweeter, which was not the case with young ones. In breeding, he thought they should not select one that had been running in a dung yard, and if they wished pigs to pay they must go on, and not stint them with their food or their straw. If they kept pigs on hot dung, they would not pay, for pigs were cleanly and would thrive best by being kept in a clean state. He would tell them that they must not put a pig to feed a pig. If they wanted a pig to pay, they must be well looked after, for pigs wanted as much looking after as a Christian in regard to cleanliness. With regard to the room a pig required, for his part he would not give them too much room, but he should not be for confining them. He found that pigs thrived best with moderate room; as they grew in size, so should their room be increased. In conclusion, he would tell them, as he had before, not to keep a pig to feed a pig.

Mr. WILSON (to Mr. Ashby): Would you wash them? I have heard of some people washing their pigs.

Mr. ASHBY: No; I never wash them; when I get them 17 stone, off they go.

Dr. POWELL said the gentleman whom he had previously named was Mr. Barber, and he was trying to ascertain if a certain amount of food would not produce a certain amount of pork.

Mr. EVANS remarked that the best sow that took the prize at Islington was a cross-bred. When they got to a certain weight, he thought they should invent some sort of a condiment to fatten them with. He bought a particular sort of pig some time ago, and at the age of nine months she took the

hog, and at the age of twelve months she gave him a farrow, which he sold at the age of six weeks for £1 10s. each. With regard to the breed, they must go in for flesh, and let them look to cottagers' pigs for example. He was not for large quantities; but they wanted a flesh-making animal rather than a fattening animal. He had found the blue Leicesters were very remunerative animals.

Mr. ASHBY said with regard to cottagers' pigs he might say that they had the whole attention of the cottager's wife. All the parings were saved and boiled down, and everything was saved that the pig could eat. He was carefully attended to, and some one to talk to him and scratch his back, and everything was done to the cottager's pig that would tend to increase flesh.

Mr. EVANS said everything was boiled for his pigs. All the old cabbage leaves and parings were all boiled for them, and his man had scarcely anything else to do but to look after the cows and pigs.

The CHAIRMAN said the following paper had been handed to him by Mr. Streeter. It was as follows:—"He (Mr. Streeter) once kept an accurate account for two consecutive years for his own satisfaction, and he had found the balance in favour of the pig. He pulped swedes and mangolds in spring and summer, and mixed ground corn with it, which kept them in a growing and thriving condition, and reduced the expense of keeping them; but if the pulped food was continued during the whole time of fattening, the fat would boil out in cooking; but if the fattening was finished with corn alone, the pork would be fine and good. His opinion was that it was a cheaper mode of making good yard manure, than making it by fattening bullocks; but, to be profitable, independent of the manure, it was indispensable that the young pig be kept on good food, and never to be let go back in condition.

Mr. HUMPHIDEN thought it was best to sell pigs as stores, than to keep them to fatten. He quite agreed with Mr. Wilson in keeping pigs to eat up the offal about the place. He (Mr. Wilson) had said he had allowed the attendance for the dung. He (Mr. Humphidge) thought if they put the straw and attendance against the manure, they would find that it would come to a pretty high price. He did not know whether Mr. Wilson had charged all the food the pigs had consumed.

Mr. WILSON said he had entered all that had come from the barn. He could not say that he had charged for every cabbage that had been given to them.

Mr. HUMPHIDEN said something had been said by Mr. Ashby about the keeping of pigs. He did not think himself that it would be advantageous to keep pigs on a place where hot dung was being continually thrown, and which they were to tread down; but that was very different to their being on a place that was continually trodden on by other beasts. Something had been said about cottagers' pigs. It was a fact well-known that where cottagers had to buy all for their pigs they could not pay for keeping. For his part, he took up the plan of feeding a pig for his men, and supplying it to them at half-price. By that means, they could keep their corn at home; and it was not throwing out any inducement for their men to rob them—not that he wished to suspect any of his men of dishonesty. At one time he kept an account of the cost of his pigs, and he found that all he got was their manure. A person he knew had kept an account what the pigs had cost him, and he never found that they cost him less than 6d. a pound, and sometimes they cost him a shilling. The principal argument in favour of fattening pigs was the large amount of manure that would be available to the farmer.

The CHAIRMAN offered a few remarks upon the propriety of keeping pigs. He had not heard the pig's greatest enemy in the room say that they did not realize their value. By exercising the same amount of care as they did with other stock, he believed that they could be kept with a profit. With regard to young pigs, the farmer was a seller of pigs, and not a buyer. He quite agreed with what had been said about the warmth of pigs. He had known lots of pigs lost by their coming into contact with the cold. Mr. Wilson wanted to know whether it was a proper, and the best time to sell them, when they were worth 15s., or to keep them to fatten. But that depended all upon circumstances. He made it a rule, when he kept pigs, to sell them for less than £1, and never to keep them over the time when they were worth £2. In every farmyard there was a quantity of waste that every pig must necessarily pick up, and the pig was thus kept at

comparatively little cost. What had been said by Dr. Short-house about skinning of pigs, so far as he could judge, he thought it would destroy the appearance of the pig if he was sent to market skinned; and, if they kept it at home, the meat would be damaged by rust. He kept pigs with a debtor and creditor account for two or three years. What they could find, as a matter of course, he did not charge them with; but all that he gave them he charged them at market price, and, at the end of the year, he had a profit, in addition to the manure, which was far better than farmyard manure. In keeping selling pigs, he had no difficulty in selling them, for he kept pigs that would sell at £1 and £2. If an account of other animals were kept—taking sheep for instance—

he believed the pig would not cost so much as the sheep; and if any gentleman was willing to take the sheep, he was willing to take the pig, and try it, and he had an impression that the balance would be in favour of the pig.

Mr. WILSON, in conclusion, said he need not make many remarks, as they were all agreed that pigs were profitable; and, after some remarks about not allowing his men to keep pigs, but that he fed pigs for them, and sold them a little below market value, he concluded by remarking upon the cleanly habit of the pigs, and he gave some facts connected with his own.

A vote of thanks to Mr. Wilson and the Chairman brought the business to a close.

ROSS AGRICULTURAL SOCIETY.

This society held its annual show of stock, grain, and roots, on Monday, Oct. 26, in a field on the Cleeve farm, within a few minutes' walk of the town on the Hereford road, and in the immediate vicinity of the far-famed and beautiful but now sadly-neglected "walk" of the philanthropist John Kyrie, "the man of Ross." Taking the show as a whole, it would have done great credit to any provincial society in the kingdom, and it was undoubtedly the best which we have ever seen at Ross; but we must ask the liberty of telling our communicative friend that it has many long strides to take before it reaches the Hereford show. It is, indeed, self-evident that no fair comparison can be drawn between the two shows. Hereford, as the metropolis of the county, seeks to gather the best white-faces from far and near, and is in a position to offer liberal prizes. Ross is not a cattle-breeding district, although it contributes a few animals to the Royal, the county, and other great agricultural shows, and as it must rely chiefly upon its own neighbourhood for the horned stock it can bring into the yard, the quantity is never likely to be very large. On the other hand, some of the best flocks of sheep of which the county can boast are to be found in the Ross district, and as the Society's regulations require at least ten to be shown in every class, with the exception of course of rams, while the general maximum number at Hereford is five, we may always expect that there will be many more of the ovine race exhibited at Ross than in the yard of the county society. And here we would just express our opinion that the rule of the Herefordshire Society as to its sheep classes might be very advantageously made to assimilate with that of the Ross Society. There are at Ross classes for "any other breed" of cattle as well as Herefords; the latter numbering five classes and the former three. In none, however, were the entries very numerous. In the first class, for aged bulls, there were three entries, viz., Mr. J. A. Holling's Chieftain the Second, Mr. John Wigmore's Speculator, and Mr. T. B. Brown's Melon. Chieftain, of capital outline and grand scale, maintained the position assigned to him at Hereford, viz., at the head of the class; while Speculator, the winner at Monmouth, and which has some promising young stock at Weston, was highly commended, and Melon was commended. Melon is very thick, but is somewhat deficient in scale, and will not bear very close inspection over the shoulder. In the class for bulls under two years old, Mr. Bradstock and Mr. Wigmore were the only competitors, the former winning with his grand young calf Bathurst (by Mr. H. R. Evans's Chatham), which was first at Monmouth, and the latter getting a "commendation" for a nice eight months old calf by Speculator. The class for breeding cows and their calves brought out four competitors, viz., Mr. John Wigmore, Captain Power, Mr. Bradstock, and Mr. Clement Cadle. The contest for supremacy was close between Mr. Wigmore and Captain Power, but the former carried the day, and the latter deservedly obtained a commendation. The class though small, was a good one. Only two lots of heifers, in pairs, under three years old, were shown, one by Mr. Bradstock and the other by Mr. Clement Cadle; but in the class for heifers under two years, there were four entries, viz., Mr. Arthur Armitage, Mr. Bradstock, Mr. T. B. Brown, and Mr. John Wigmore: a capital class, Mr. Bradstock's prize heifers showing a great deal of character. The classes for "any other

breed" brought half-a-dozen lots of shorthorns into the yard. We were much pleased with the cows of Mr. Evans, of Hom, and are not prepared to endorse the judgment which gave the prize to Mr. Theyer, of Walford, for we failed to perceive the great merit which his white cow was said to possess. The heifers of Mr. Evans and Mr. C. Marfell were both good; and so probably were the two bulls, the property respectively of the same gentlemen, but we also confess to a liking for something of a different stamp. It should be stated that both were in poor condition, and shown in the "rough," and the young brown bull of Mr. Marfell was said to have done an amount of hard-work which almost necessitates the services of a "Cocker" to calculate the number of his progeny.

We come now to the great feature of the Ross Show, and we must congratulate the Society upon its grand show of sheep, especially in the long-wool classes. The animals were all good, and some of superlative merit; the Cotswolds, and crosses between the Cotswolds and Leicesters, being the principal varieties. Our prize list will show many commendations, and should be taken as the best index of merit; but we should just note that Mr. Wigmore's ewe lambs were very grand, and his yearling Cotswold ram a veritable beauty, of immense scale, good fleece, and capital head. Mr. Kearsley's Cotswold ram in the same class was very superior, and we also liked Mr. Bradstock's "Lincoln" ram, which had a great deal of character about it. This is, we believe, about one of the first "Lincolns" that has been introduced into the district for the purpose of crossing. Nor should we pass over without notice the neat little "pet" ram from Ballingham Hall, with a fleece as white as ermine—attributable, as a friend informed us, to its drawing-room nursing; but we do not credit all we hear, and can only wish the worthy hon. secretary of the Society better luck next time. In the classes for short wools there was not much competition. There were three single entries, and Mr. Armitage, opposed only in two classes, made a "clean sweep" of all the first prizes with his "Shropshires," remarkably good in symmetry and quality, but somewhat light in scale relatively to what we see of the famed Salopian breed in some other parts of the kingdom. As we remarked last week, many farmers maintain that the "Shrops" degenerate upon Herefordshire soil, but whether that be the case or not we are not in a position to say. In addition to the Society's prizes, we should here include Mr. Walter Morris's prize for breeding-ewes, to be shown, in proportion to acreage, from 20 down to 5. This was a very attractive class, Mr. Wigmore being the winner with 20 capital Cotswolds; Mr. Armitage highly commended for 20 Shropshires; Mr. R. H. Garold, of Kilforge, and Mr. Evans, of Hom, showing respectively 15 and 10 long-wools of a very useful type. The extra stock department also contributed largely to swell the number of sheep in the yard, Mr. Wigmore showing 60 stock ewes and 5 ram lambs, all of first-class character, the lambs uncommonly good; Mr. Hartland, of Biddlestone, 20 very nice long-wool lambs; and Mr. Geo. Preece, of Ross, 10 Southdown ewes. We would specially commend this feature of the show to our Hereford friends, and ask them if something cannot be done to ensure the exhibition of sheep in large numbers. One step has been taken in the right direction; and it may, we think, be easily followed by others. Mr. Wigmore, our report shows, had nearly 100 sheep in the Ross yard.—*Hereford Times.*

FIRE AND WATER v. CORN AND HAY.

At the Torksey and Doddington Society's meeting, Mr. T. Hutchinson said: Seventeen years ago he wrote a pamphlet, which he thought he might consider not only as read, but as proved to be correct, for, although it was taken up rather discourteously by the engineer of the Royal Agricultural Society at the Newcastle meeting, and sneered at, the advice he tendered had been adopted to some extent by the Government. The pamphlet in question was with reference to under-draining. He never drained without putting one at the head to connect all the others, with the view of circulating pure air, and his system, which had been generally condemned at the time, had been now very generally adopted. The reason deep draining was originally brought into disrepute was the fact that the drains were not made close enough by the engineer in question, and many agriculturists found it necessary to make new drains between those originally formed. He (Mr. Hutchinson) recommended as a rule—though of course all rules had exceptions—that in draining clay land the drains should be 3 ft. 6 in. deep, and 7 yards apart. In his experience he never knew that to fail, and the expense was no greater, if, indeed, it was so great, as draining 9 yards apart and 4 feet deep. When he recommended, 17 years ago, that the minimum depth of drains should be 3 feet, he was considered wide of the mark, but he had proved to be correct, and he had never found a place where he could not get an outfall of at least that depth by bringing up fall. Where such an outfall could not be obtained, draining had better be left alone. With regard to the subject of steam cultivation, he could not say more than would be found in his pamphlet, which they could all readily obtain, so that the remarks he intended to make would be of a practical nature, rather than an explanation of the advantages of the system of cultivation set forth in his pamphlet, to which he might have occasion to refer. It had frequently been said that it was all very well for men just entering upon farms to introduce cultivation by steam, but those who had horses, implements, and everything necessary for horse cultivation were placed in a very different position. All men had entered upon their farms at some time or other, and could start afresh if they chose: they were not bound hand and foot to the present system of horse cultivation—a system by means of which less crops were obtained at a greater expense than by means of steam cultivation. It had also frequently been remarked that steam cultivation could only be introduced on large farms, and undoubtedly its introduction would be attended with greater advantage on large than on small farms and fields. But it was not an insuperable difficulty to cultivate small fields by steam if the apparatus provided was suitable. Those farmers who said their holdings were too small, and that they could not afford the cost of the apparatus, ought to encourage the manufacture and introduction of machinery appropriate to small farms, rather than machinery and tackle appropriate to large farms only. It behoved small farmers—men with small capital—to seek out the mode of applying steam cultivation, for it was a system which would go on; by its means the saving of expense was so great, and the increased production so large, that they could not do without it with wheat at 40s. per quarter. Some might ask for figures showing the cost of steam cultivation, and an estimate of the expense of horse cultivation. In 1861 and 1862 he adopted steam cultivation on a farm in Bedfordshire consisting of 546 acres of very strong land, and from a summary in his pamphlet it would be seen that the gain by increased produce the first year steam succeeded horse cultivation was £776 2s. 11d., added to which was a balance of expense the first year in favour of steam over horse cultivation of (the former) £289 0s. 8d., the latter £589 2s. 6d.), £297 12s. 2d., thus showing an increased advantage by the adoption of steam of £1,078 15s. 1d., twice the value of the engine and apparatus employed. Besides this, the fee simple value of the farm was improved £1,500 over and above what could have been accomplished at a greater cost by horse power. That was a startling

fact; but in his pamphlet they would find all the details, if they chose to look for themselves. There was a deal of difficulty in effecting the introduction of reaping machines in this county. He was agent of a property in Durham and Yorkshire, which was divided into small farms of from 200 to 300 acres, and of the 12 tenants no less than eight had reaping machines of their own. Now he did not give these tenants credit for increased sagacity over their Lincolnshire brethren; to some extent the machines were forced on them by the fact that all the excessive labour was absorbed in the coal-fields and iron-works, and as a consequence, agricultural labourers were difficult to obtain. Still there could be no doubt these machines were of immense advantage, and that they were not more generally adopted was owing to cheap labour. So, low prices for produce would do more than any other thing to force on the introduction of steam cultivation. He thought that if landlords, tenants, and agents were to put their heads together, there would be very little difficulty about it. The surplus horses on the farm could be disposed of, and the fodder which was formerly required for them would keep cattle and sheep instead, so that it must be more advantageous. The thing was so palpable that if it were well laid before landlords by their tenants all difficulty whatever would vanish. Perhaps it would ill become him to say which system was the best—Fowler's, Smith's, or Howard's—because he had only the experience of Smith's, which he highly approved of, and one thing very much in its favour was that it was not at all expensive, for all the machinery required could be set up at an expense of £500. He had really, however, no interest in the matter. If the tenantry in one parish could unite, and purchase the apparatus he had named, he could not see any great difficulty as to expense. A Steam Cultivation Company was in course of formation in London, under very high auspices, and a capital of £50,000 was required before commencing operations, and when this company was fairly started, any difficulty as to capital would no longer continue. It was a very trite observation that a friend of his overheard the other day at a railway station. Two farmers were engaged in conversation about steam cultivation, when one said to the other he scarcely knew what to think of it, to which the other replied, "If we can get cultivation by steam at half the cost of horse power, we shall have a great deal more money to spend in muck." This showed that the man had a desire not simply to have his increased returns, but to turn them to compound interest. With regard to the different cultivators, two of Smith's would cost little more than one of Fowler's. That did not say that Smith's was the best; but if he could show that one of Smith's would do as much work as one of Fowler's, then it would evidently be to the farmer's advantage to adopt the least expensive apparatus. The report of the judges in the Journal of the Royal Agricultural Society, stated that in the trial field Fowler's apparatus worked at the rate of 10½ acres a day; and against this they had the statement by Mr. Moscrop's two years' experience, in his prize essay, that Fowler's worked only at the rate of 4 acres a day. Against this they had the report of the judges that Smith's worked at the rate of 6 acres a day, and he (Mr. Hutchinson) could show that the one he had did rather under 6 acres the first year, and rather over the second, so that his two years' experience told him that in practice he did 6 acres a day with one of Smith's apparatus—in all 1,524 acres. There was a deal of difference between practice and theory. Fowler's implement was a splendid one, and agriculturists were much indebted to that gentleman, for no apparatus could possibly do its work better, but he contended that an apparatus much less costly, doing as much or more work, and as well, must be preferable. He (Mr. Hutchinson) had made two attempts at farming, the first time being twelve years ago, and he might as well give them an outline of the results. In his first attempt he could not show a good balance-sheet. He was obliged to take in hand a strong clay land farm of 300 acres, 800 acres of which were arable, and started with the intent of

employing 46 horses. Not an acre of the land was drained, there was no road upon it and no gates, and no buildings except stables; so they might be sure he started under a disadvantage. He first purchased 30 horses, at an expense of £43 each, one of them being a French horse, which he obtained in London. The latter was a really splendid animal, but unfortunately it introduced the glanders into his stables, and he lost no less than 15 of the horses in a very short time, nine having to be shot one morning. This, they would agree with him, was a very serious matter, and as he dare not buy new horses, the land was badly managed. He purchased a number of bullocks, but they were very slow, and altogether he employed £7,000 on the farm, and he left it little better than when he entered upon it, after losing £5,000, sinking some permanent improvements. The next farm he had to take in hand contained 546 acres, and he asked for a capital of £4,500 to work it, but after he had had £3,500 the owner would not let him have more, for fear the result should be no better than in the first case. He had, however, this advantage: he had the privilege of keeping the rent until he found it convenient to pay it. What was the result? He paid the rent and the capital in two years. This was by the aid of steam cultivation, and when he left the farm it was worth £2,000 more than when he entered. When he took it every field was a perfect bed of twitch; but he left it, with the exception of one field, as clean as any garden in the country, and he could not have done this if he had had fifty horses. It must be admitted that the result was highly favourable, and showed that steam cultivation had great advantages over horse cultivation. He would have them, by all means, to use every effort and endeavour, by combining together or otherwise, to introduce steam cultivation on their farms, whether large or small. One feature came out rather strong. They all knew that a deal of time was lost on wet days, and on Sundays, and if they would permit him he would read a paragraph from his pamphlet, with reference thereto. It was as follows:—

"Having shown, from first to last, the cost of our steam and horse powers respectively, it is important to ascertain the loss in the summer half-year of 1862, on the 40 non-working days: 15 days from wet weather, 1 from breakage, and 24 Sundays.

STEAM POWER ON NON-WORKING DAYS. £ s. d.			
Interest on £500 value of engine and steam cultivating apparatus, at 5 per cent. per annum, for 40 days.....			
	2	14	9
HORSE POWER ON NON-WORKING DAYS. £ s. d.			
24 horses, attendance upon in the stable, at 1s. per week each, for 40 days			
	6	17	1
24 horses keeping, £30 per annum each, £720, for 40 days			
	78	18	0
24 horses, cost of, at £30 each, £720, interest at 5 per cent. per annum for 40 days.....			
	3	18	10½
24 sets of plough harness, and 8 ploughs, cost £84, interest at 5 per cent. per annum, for 40 days 0 0 2½			
	£90	8	2
24 horses' value of manure, at £7 10s. each, per annum, for 40 days, deducted			
	19	14	6
	£70	8	8

We thus find that, on the 40 non-working days under steam power, representing 24 horses, we sacrificed £2 14s. 9d., or 2s. 3d. per 24 horses per day (little more than 1d. per horse per day); and under horse power, £70 8s. 8d., or 58s. 8d. per 24 horses per day (2s. 5d. per horse power per day), showing a difference of 96 per cent. on non-working days, or in the whole, more than the value of two horses in favour of steam. It will be useful further to reflect how many more than 40 days must necessarily be sacrificed in a winter half-year, and remaining days being immensely shortened, with little or no diminution in horsekeep and other charges."

With regard to the removal of the apparatus from one field to another, less time was wasted than was generally thought.

"It is commonly said that steam cultivation cannot be advantageously introduced, even on large farms, if the fields are small; we think the objection applies with much greater force to horse cultivation. A steam cultivator, such as we have employed, will operate closer to the fences, and turn at the ends with greater facility with a breadth of 36 inches, than a pair-horse plough can do, with a breadth of 9 inches—the

plough would thus have to turn four times to the steam cultivator once; and if the two hours occupied in moving a steam apparatus from field to field is divided by twenty-four (the number of horses represented by our steam power), no more than five minutes are left to each, or ten minutes to a pair-horse plough to do the same thing. But if we take into account that the common plough has to make in the field four turnings to one of the steam cultivator, incomparably less time is wasted in working steam than horse power, without bringing to our aid the time occupied by the several journeys daily, to and fro, between the stable and the field."

In addition to steam he had ten horses, and the party who followed him took to the horses and the apparatus. His successor reduced the horses to eight, and this winter he intended to have only six. It should also be remembered that only the apparatus lay idle when there was nothing further for it to do, as the engine could be used for thrashing and for cutting fodder. There was another extract or two which he might make from his pamphlet:

"There is a common observation, that 'it is preferable to hold good land at a fair rent, than to hold bad land free.' In this there is much truth, in consequence of the occupier of the latter having to cultivate, at a greater acreage cost, a larger surface than the occupier of the good land, to procure an equal value of produce. Steam cultivation more than doubles the amount of the active soil, as we have seen, at an immensely reduced cost, and makes it ever afterwards easier to cultivate, without adding to the surface area of the land under cultivation. If a tradesman requires more available space for his business, and cannot obtain additional surface area, he either adds a cellar or a storey to his premises. Let the limited agriculturist learn a lesson, and enhance in like manner the capabilities of his farm, by extending his underground operations, and otherwise expending his capital judiciously on the surface—advantages and privileges it would be difficult to over-estimate; and well indeed would it be for operators, and the community at large, if they were more considered and practised.

"Depend upon it, the only sure and practical way to meet increasing supplies of foreign corn and low prices, is to drain the land effectually, to adopt steam cultivation as a principal, and not merely as an auxiliary power, to grow more green and root crops, to breed and feed more sheep and cattle, and to convert stables into cattle boxes.

"Our tabular statements have demonstrated, we think, most conclusively, both parts of our proposition, that cultivation by steam power can be accomplished at less cost than by horse power; and the result, with regard to produce, is more in favour of steam. The main obstacle—the great expense—to the profitable cultivation of strong land is removed, having shown that it can be worked at as little cost by steam, as light land by horse power. We do not, by any means, wish to imply that steam power cannot be applied to light land with corresponding advantage; for, besides an immense increase of power, we have the command of speed in equal ratio; and whilst we cultivate strong land, say at the rate of four miles an hour (instead of two by horse power), light land can be operated upon by steam power at from five to six miles an hour, with implements of larger proportions."

In autumn of 1862, the proprietor, who in the spring of 1861 could not find a responsible tenant for his land, found plenty of candidates for the occupation of this once despised farm. It was then pronounced by all comers (one piece barely excepted) to be perfectly free from live twitch, and was let to a tenant of capital and enterprise, under most severe competition. He had shown that the apparatus would apply equally to light as to strong land. In conclusion he urged upon small occupiers the fact that they could apply steam to the cultivation of the soil with the same advantage as to the thrashing of corn, and he warned the farmers present, whether their holdings were large or small, that they must not set their faces against the introduction of steam, for if they did, they would, as agriculturists, go to the wall. The only means they had of meeting the extensive importation of corn was to increase their facilities, and decrease the expense, of growing it in this country. After expressing his willingness to answer any question that might be put to him on the subject, Mr. Hutchinson concluded.

The VICE-CHAIRMAN (Mr. Howard, of Fenton) said he had been much pleased with the address of Mr. Hutchinson,

and should be glad to have some private conversation with him. The principle of cultivating by steam was good, especially on strong land, but he was one of the unfortunates who did not occupy any land of that description. (A voice: "One of the fortunates, you mean.") He thought, however, Mr. Hutchinson had brought forward very extreme cases, especially with regard to his great loss of horses from glanders, and it might be that the French animal had the disease when he purchased it, and that the unfortunate results which followed were entirely owing to his want of judgment. The remarks made by Mr. Hutchinson with respect to underdraining were very good, as he (Mr. Howard) had proved by his own experience.

The Rev. C. NEVILLE said: With regard to the able speech of Mr. Hutchinson, he must say that he could not agree with that gentleman as to the principle of small occupiers applying steam to the cultivation of the soil. He (Mr. Neville), as all his friends knew, occupied a similar position compared with the large landed proprietors, as small occupiers did in comparison with tenantry such as Lord Yarborough's. In the Thorney lordship there were upwards of 2,000 acres, besides wood, which was divided into farms of about 100 acres each. He had been told by many of his friends that he must throw all these farms into two, and erect suitable buildings upon them. He replied that he should not like to turn out so many tenants, but was told that he would get a greater rent, and that the land would be better managed. He (Mr. Neville) then said that supposing he were to do such a thing, and to spend £10,000 in buildings, and were to get no more rent, he would get sadly wrong. Now his tenantry were present that day, and he would say, whether the seasons were good or bad, they always paid their rent punctually, and that he never had the word "arrears" in his rent-book. Supposing the Duke of Northumberland were to make a change like this, and to discover that it did not answer; why he had simply made a mistake, and went away in his carriage knowing that it would make very little difference to him. But that would not do for Christopher Neville. And it would not do for tenants of 100 or 150 acres to go to Lincoln, and order a steam apparatus for cultivating the soil without mature consideration. If a small tenant made such an experiment and it did not answer, he would have to give up his farm, and, therefore, they thought it a wise thing to let the large farmers make the experiment, and see how it answered, before they made so great a change in their system of cultivation. Mr. Hutchinson had paid great attention to the subject, and was a high authority, and they must, therefore, be very much obliged to him for his information. A friend of his (Mr. Neville's) residing in Yorkshire, a rich man, gave £780 for a steam cultivator. He got it in fine order; it did its work beautifully, much better than the horse plough, and turned up the soil deeper. While the men were at dinner he and his friend sat upon the apparatus, and he said to him, "It does its work beautifully, but does it pay?" Mr. Saltmarsh replied, "Why, Neville, you're an old friend of mine, and I don't mind telling you: it does no such thing." But Mr. Saltmarsh might have gone to a greater expense than Mr. Hutchinson, and he might not have applied it with the same skill. The men returned, and went on with their work, and soon afterwards they heard a loud report, which proved to be the snapping of the rope. There was no means of mending it, and Mr. Saltmarsh said it was no joke, as the rope cost a deal of money; but he got over the difficulty by buying another, which a small tenant farmer could not do. He men-

tioned this as a justification of the apparent slowness of farmers in adopting improvements, and, indeed, it was a dangerous thing to adopt great changes without careful consideration. He might also mention that his friend reduced the number of his horses, but when harvest came and the crops were ready to be led, he would have given anything for horses to mow the corn from the fields. He had also a similar difficulty with respect to leading manure. He should like Mr. Hutchinson to explain how he managed to lead his corn and manure, on a farm of 546 acres, with only ten horses.

Mr. T. K. SHARP said, with regard to Mr. Hutchinson's remarks, he might observe that it was all very well to pooh-pooh them; but the parties who did so should obtain a copy of the pamphlet, and study it for themselves. It was a subject Mr. Hutchinson had kindly come here to ventilate; and he had given some very useful information. He had carefully read the pamphlet himself, and had come to the conclusion that, although it was a great outlay for small capitalists to purchase the apparatus, a number of tenants under the same landlord might combine, and purchase one for their joint use.

Mr. F. WILSON said he agreed with the principle of steam cultivation to a certain extent; but he considered there were many and insuperable objections to it. He kept seven pairs of horses, and if he had an apparatus, he would only require two pairs; but then how would he be able to get his corn and manure led? He would back spade cultivation against steam. They had a certain class of men whom they must keep. At present they required a number of horses; and boys and men were necessary to take care of them. If they had to keep a certain number of horses to do part of their work, why not let them do all their work?

The Rev. C. NEVILLE said he should be sorry for the meeting to be under the impression that he had cast any ridicule on what Mr. Hutchinson had said; for he never meant in the slightest degree to pooh-pooh the pamphlet—first, because the writer was known to be an able practical man; and second, because he had not read it. He should certainly like to see cultivation by steam adopted, if he could be satisfied that it would pay; for if his tenants made greater profits, they would not object to pay him a little more rent.

Mr. HUTCHINSON said he had great satisfaction in attending that meeting, at the invitation of the Chairman, to make a few observations on the subject of steam cultivation; and if he had not expressed himself as he could have wished, still they would understand about what he meant. With regard to the way in which he got in his harvest, he might say that, with his ten horses, the whole of his crops were led sooner than those of any of his neighbours. This was by means of one-horse carts. He got all his manure out, and worked and drilled his land with the greatest facility, the horses being in very good condition in consequence of the lightness of the work they had to do. What he recommended small farmers to do was this: Let two, three, or four join in the purchase of an apparatus, which would cost something less than £200, and they could hire one of the many steam engines belonging to men who let them out; and as it would be required at a time when but little threshing was going forward, they would be able to do good both to themselves and to the owners of the engines—say eight-horse power for light land, and ten-horse power for strong land. That was the easiest mode for small farmers to adopt; for the expense would be but trifling and the result highly satisfactory.

BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The usual monthly meeting of the council of this Society was held at Taunton, on Saturday, Oct. 31: present, Earl Fortescue (president), in the chair; the Earl of Portsmouth, Sir M. Lopes, Bart., M.P., Sir J. Duckworth, Bart., Sir J. Duntze, Bart., Colonels Acland and Luttrell, Drs. Brent, Gillett, and Scott, Messrs. Adair, Andrews, Archer, C. and R. H. Bush, G. Braginton, R. G. Badcock, Cotterell, Danger, J. T. Davy, J. Daw, E. S. Drewe, R. Dymond, H. Fookes, M. Farrant, J. Fry, Jao, and Jonathan Gray, C. Gordon, T. Hussey, J. E.

Knollys, G. Langdon, J. Lush, H. G. Moysey, S. Pinner, G. S. Poole, J. P. Pitts, W. Porter, J. and J. W. Silliphant, E. C. Vidal, J. W. Walrond, H. Williams, W. Wippliff, J. Wildcombe, H. St. J. Maule, and J. Goodwin.

THE BAZAAR MEETING.—Mr. Moysey, as chairman of the stock prize-list committee, brought up the amended prize list, and remarked that, after very anxiously considering the resolutions of the council at their October meeting, the committee, having regard to the fact that one of the main-

mental objects of the society was to encourage the improvement of breeding stock in the West of England, had felt it their duty to recommend that the prizes for stallions should not be discontinued, but that, at the Bristol meeting in June next, prizes of the same amount as at the Exeter spring meeting, should be given for thorough-bred stallions best calculated to get weight-carrying produce, to serve not less than 30 mares, in the counties of Cornwall, Devon, Somerset, Dorset, Wilts, and Gloucester, and in South Wales. A long and earnest discussion followed, in the course of which the following principles were affirmed:—1st, that as the encouragement of breeding stock is a fundamental principle of the Society, it is desirable, in the case of horses, to offer

prizes for good sires and dams in preference to good produce; and 2dly, that the prizes should be so offered as to encourage improvement in the breeding of horses in the West of England. At the Bristol meeting there will therefore be prizes for thorough-bred and agricultural stallions, as there were at Exeter, but the competing animals will have to be shown for the first three days of the June meeting, instead of in the spring. Subject to these modifications, the prize list as approved at the October meeting was confirmed, and ordered to be issued as soon as practicable. In order to keep clear of the Ascot, Bath, and Epsom races, the Bristol meeting was fixed to begin on Monday, June 13th.

THE MALT-TAX AND THE HOUSE OF COMMONS.

WHAT IS REQUIRED OF THE FARMERS.

SIR FITZROY KELLY thus addressed the members of the Ipswich Farmers' Club. Let the speech be read in every farmers' club in the Kingdom! He said he hoped he might begin by congratulating them, at least to some moderate extent, upon the recent harvest. Since, however, he had come under that roof he had heard some expressions dropped, somewhat complaining of the present prices; and if the complaints were well founded, it certainly was to be lamented that even in a year when Providence had befriended in an extraordinary degree the cultivators of the soil, whether from the evils of past legislation or something indigenous to and inseparable from our agricultural constitution, even an abundant harvest failed to satisfy the cultivators of the soil. He thought however, he might congratulate them upon the harvest. He might not improperly remind them of what he took to be a leading object of such associations as this—the importance of increasing the produce of the land in quantity and improving it in quality. He knew not whether the mighty improvements which had taken place of late in agricultural chemistry, and in the construction of agricultural machinery, had really produced the effect which was intended by those who designed and promoted them. If they had failed to do any essential benefit to the practical farmer, all he could say was that there must be something in British farming of a nature that defied the best efforts of men, and almost resisted the beneficial interference of Providence. He would pass to what more particularly affected him in his province of their representative in Parliament; and he asserted that the farmers were not the favourites of the Legislature. They found all other classes realized occasionally colossal fortunes; but he never heard of a cultivator of the soil becoming rich, no matter what capital, skill, or industry he employed. Therefore it behoved them to consider whether they had not a strong claim upon the Legislature for an extension to them of some of those advantages which had been so liberally dealt out to almost every other class. The duties upon foreign manufactures and wines had been either entirely removed or reduced to their lowest point, whilst no reduction had taken place in the malt tax, though foreign malt was admitted with but a very small duty, such that if the continental maltsters were as well up to their business as the English they must force the latter out of the market. Under these circumstances, he and some other friends of agriculture obtained a committee of the House of Commons for inquiry into the effect of the malt duties on the agriculture of the country, upon the produce and price of barley and malt liquor, and likewise to consider their effect in relation to the feeding of cattle on malt. What was now wanted was that those who were practically acquainted with the subject should furnish them with arguments, and especially with facts, to lay

before the Committee when they met after the re-assembling of Parliament in February, so as to satisfy the Chancellor of the Exchequer, who was a member of the Committee, and who was not very favourably inclined to agriculture; or if they failed to satisfy him, to satisfy the House, not that the malt-tax could at once be repealed, but so much reduced as to afford relief to the agriculturist and yet scarcely to diminish the amount of the revenue. He had examined the statistics on the subject from the first imposition of a tax on malt in 1697 to the present time, and he found that as the duty was increased so the consumption both of malt and beer fell, and when the duty was lowered the consumption increased, and he believed that if the duty were now reduced one-half the consumption would be doubled and the revenue remain nearly the same. He believed that four or five millions of acres of land at present waste, but which was quite capable of growing good barley, would be put into cultivation, and consequently a vast opening for labour would be made. Such considerations as these would have great effect on the legislature, and he asked them to assist, as a society, by correspondence with other societies, and as individuals, in getting up evidence which he could place before the committee. Societies had been formed elsewhere for collecting information and supplying it to the members of the committee, and surely what had been done in other counties could be done in this, which was one of those chiefly interested in the growth of barley. Efforts were being made all over England, and let it not be said that Suffolk, after setting the example, had grown indifferent and inactive. If they could collect evidence which would prove to the Government that the farmer might be permitted to malt inferior barley solely with the object of feeding his cattle, and that safeguards could be used effectually to prevent any frauds on the revenue, he believed the Government would at once consent to the manufacture of any quantity of malt to be applied to that purpose. He understood that that would effect a complete revolution in feeding cattle, and would tend more to enrich the grazier and the farmer than any Act the Legislature ever passed. On this question, then, let them collect evidence. He again asked those who had any experience on this subject to communicate with him, and he hoped, if they met after the next Session, to report a change more beneficial to the farmers than the oldest of them could remember. If they considered that the members of the House of Commons who represented the agricultural interest had tried in vain for thirty years to get the house to take the first step, and that they had now succeeded in getting that first step—if they let the opportunity pass, by their own negligence, he should regret it—he had not himself to blame, but it would be the agriculturists themselves who would be to blame.

LONDON, OR CENTRAL FARMERS' CLUB.

THE VETERINARY ART IN RELATION TO AGRICULTURE.

The first monthly discussion meeting of the Farmers' Club, after the autumnal recess was held on Monday evening, November 2, Mr. H. TRETHEWY, in the chair. The subject for discussion, namely, "The Veterinary Art in Relation to Agriculture," had been assigned for its introduction to Mr. Fisher Hobbs; but in consequence of that gentleman's being confined at home by indisposition, the duty was undertaken by Professor Brown, late of Cirencester College.

The CHAIRMAN in his opening remarks expressed his regret that on the first evening of the "session" the Club were deprived of the presence of the chairman of the year, Mr. Bradshaw, who would in due course have presided on that occasion, but who was unfortunately absent. He added that Mr. Hobbs, whose name appeared on the card as the introducer of the subject, was, as they would all be grieved to hear, confined to his house, if not to his bed, and was therefore unable to attend.

At the request of the Chairman, the SECRETARY, Mr. Corbet, read a letter from Mr. Hobbs explaining the cause of his absence.

Professor BROWN said: Mr. Chairman and gentlemen, it is not difficult to understand why in all periods the practical has been popularly preferred to the theoretical. There is something especially satisfactory in evidence which addresses itself to our senses. That which we can see and touch is not a matter for speculative discussion; while the conclusions of the philosopher, however rigidly deduced, do not appeal with the force of truth to the uncultivated intellect: Between practice and theory the difference is, however, really one of degree. The practical man must think: that is an absolute necessity of his intellectual being; and the veriest theorist must in some degree act in obedience to a necessity of the physical constitution. The two things are, however, opposed; and in proportion as a man excels in the one he is deficient in the other. The constant application that is necessary for the attainment of great physical tact is opposed to an exclusive cultivation of the intellect; and, on the other hand, constant indulgence in speculative and abstract reasoning is opposed to the attainment of any great degree of physical excellence. Man thinking and man acting will always be distinct; they may move in concert, but they will never become one. A large part of our discussions at the present time seems to me to arise from a want of distinct comprehension of the terms we are in the habit of employing. We hear of art, science, practice, theory, philosophy; but there has yet to arise the authority that shall give these terms a precise meaning. They express your ideas or mine, as we think proper to use them; and there is no possibility of deciding in what particular line, as it were, our minds shall think. In fact many of our discussions are admirably illustrated by the fable of the two knights, who, by chance, were resting on opposite sides of the same shield. The shield was composed, as you are doubtless aware, on one side of silver, on the other of brass. In a discussion between the knights on the material of the shield, allusions were made

by each as his senses dictated. A dispute consequently arose, and in the strife which resulted, it turned out that the combatants had been cutting and hacking each other because they happened to be on the opposite sides of the shield. We have before us to-night, gentlemen, two subjects of an eminently practical character—agriculture, and the veterinary art. However distinct these may appear now, there is a connection between them, which will be obvious enough if we trace them to their origin. If we could go back to the time when our first parent, that "grand old gardener," as Tennyson called him, turned the first clod of earth, and thus laid the foundation of the agricultural system, and if we could trace agriculture through each successive step up to the present moment, what a wonderful history it would be! How interesting it would be to watch the gradual dawning of facts, one after another, on the slowly-awakening human consciousness—the growth of plants, the influence of the seasons upon them—the discovery of the astounding fact that soils, after a certain time, would lose their fertility, and not regain it till after a long period of rest! We can imagine how it was found out that in the excretion of animals there existed a remedy for the loss of the fertilizing power, and that there was thus laid the foundation of the system of manuring. We can conceive how, gradually advancing, men discovered how each man could appropriate a certain portion of land to his individual use for a time, and allow the remainder to continue in its natural state till it had attained the requisite properties; how, gradually advancing on this, it became the province of the science of chemistry to show that, by giving to the soil the materials on which plants required to feed, an almost *ad libitum* supply would result. Doubtless, a problem remains yet to be solved—it is for chemistry to solve it—how, by adding, in the form of artificial manures, to the soil, we may do away with the necessity for fallowing, so that we may no longer have cause to regret that soils lose their fertilizing powers by long use. But, gentlemen, it is not alone to the cultivation of the soil that agriculture is required to devote attention: it has also to deal with flocks and herds—to supply the people with animal as well as vegetable food. And we may well imagine that, in primitive times, when so large a proportion of the wealth of the country consisted of flocks and herds, the first inroads of disease must have struck the agriculturist with alarm—how he must have been forced to exercise his ingenuity in the selection of healing plants; and how, by gradual efforts and very doubtful success, the veterinary art arose (as it unquestionably did) out of the science of agriculture. As civilization advances, the two things become distinct. The veterinary art, no longer being in the hands of the farmer, became the property of the ignorant and uneducated, so that the name of horse-doctor was an opprobrium. Thus we might trace its struggles through various stages of existence, up to the present century, when it took its place as a distinct profession, with its schools and colleges, enlisting among its members men of education, and ranking fairly as one of the liberal

professions. But, though a great deal has been done by veterinary science, it is a melancholy fact that the stock of the country has not experienced an amelioration in proportion to that of other departments. Statistics inform us that an enormous percentage of animals die yearly from diseases which veterinary science seems powerless to remedy. This is not satisfactory to reflect upon. Bearing in mind the enormous influence on the prosperity of the community which agriculture must always exercise, particularly in a country like England—recollecting the effect on the health of the people which must inevitably be exerted by the condition in which meat is sent to market—it is certainly not satisfactory to reflect that so enormous an amount of disease exists among agricultural stock as is known to prevail at the present moment, and has prevailed for a considerable period. Now, in endeavouring to find a solution of this difficulty, one is forced to the conclusion that agriculture has not availed itself to the extent that it might have done of the improvements in the veterinary art. I am speaking from experience of considerable extent in an agricultural district when I assure you that the stock of the country is not in the hands of educated practitioners (Hear, hear). The number of those who are practising, so to speak, without a licence—the number of those who are uneducated, uncertified, and, in many respects, unfit to attend to so important a matter as the health of the stock of the country, is more than double that of the certified practitioners who have emanated from one of the colleges. This fact was brought out through the labours of the Secretary of the Veterinary College in London, at the last meeting of the members of that institution. In my own visits to farms in various parts of the country, I have constantly met with men of the class to whom I have alluded. Personally, one has of course nothing to say against them; they are as much justified in getting their living in their way as we are in getting our living in ours; but that is no reason why they should be left by farmers to do the amount of mischief that they unquestionably do. I am free to admit that the ravages of epizootic diseases are altogether irremediable by medical treatment. Beyond all question the attacks of such maladies as pleuro-pneumonia and small-pox in sheep are beyond the reach of the veterinary practitioner. Science has not yet discovered a remedy for either of them. But under a properly regulated system they could never have done the mischief in the country that they have. For example, a certified inspector is sent for, to inspect a farm. The tale has gone forth that pleuro-pneumonia is there. Thinking calmly on the matter, one is often tempted to smile at the whole affair. Reports go forth that on a certain farm pleuro-pneumonia has appeared, and that by well-directed efforts on the part of the owner its ravages have been stopped. Gentlemen, such a thing has never happened yet. I have myself been called in, in some of these supposed cases of pleuro-pneumonia. After walking among the stock, I have said to the owner, "I do not discover any signs of the disease; on what is your opinion founded?" The reply has been, "These animals showed certain symptoms, we treated them in a certain way, and the disease stopped." I have inspected the remains of animals that have died, and found nothing of the disease. In one case a gentleman had been induced to fumigate his sheds with vapour of tar, or something of that kind, as a specific for the malady, and he told me that by so doing he had saved all his stock with the exception of one animal. That one I have no hesitation in saying he had suffocated

(laughter). An animal might have had a cold or a cough, but I am enabled to say that there was no case of pleuro-pneumonia. Cases like that to which I have thus referred are not uncommon. One sees receipts constantly given which are of no use; one sees some trifling application in the nature of fever medicine, nitric ether, simple nitre, or something of that kind, advertised as a successful remedy for pleuro-pneumonia on a farm; and what I contend is, that there has not been any instance of that disease on the farm where the supposed remedy was successful. It must indeed have been evident to the scientific man that there never had been such a case. Is it reasonable to suppose that a disease which has baffled the accumulated science of the time, and on which no medicine that has been discovered has the slightest influence, would yield to a dose of nitre or nitric ether, which one uses for a common cold? On the face of things the notion is altogether absurd. Now it seems to me that such mistakes could not have occurred, had the connection between the veterinary art and agricultural practice been thoroughly realized. To what extent that connection should be allowed to subsist, is a question of detail, into which I cannot possibly enter within the limits of a discussion like this. But, with the view of pointing out its leading features, let me refer to the origin of the animals which we have to deal with—in other words, to the question of breeding. Take one important department of animal existence in the present day—horses. Of cart-horses we have a fair sample. In some parts of the country they are very good; but a very large proportion of them are badly managed. The stables are generally altogether unfit for the residence even of an organised being of a lower denomination: and the treatment which horses meet with is anything but respectable. Still, these animals by some means or other have escaped the deterioration which has affected other classes. Take, however, the hack. Where is he? Where, I say, is that animal at the present time? Do you mount a horse once a month, without almost feeling sorry that you have been inveigled into the saddle? It is only by the rarest chance that one meets with an animal that will carry one pleasantly. I do not mean to deny that you may find plenty of animals that will carry you safely to your destination and back again; but, assuming that you desire to have some pleasure in equestrian exercise, how rarely do you find an animal that can ensure it! And is this to be wondered at, when we consider the animal's origin? As Mr. Corbet has said, whatever animal a man happens to have, he puts it to anything that turns up. In fact, about as much attention is devoted to this subject as one ordinarily bestows on a sitting of Cochon China fowls or raising of a litter of puppies. Let us pass on now to the hunter. In this case you may get an animal that is very fast, and will jump remarkably well; but in anything like the old-fashioned run of five-and-forty minutes, how remarkably few animals will you find in at the finish! How much is there sacrificed of good bottom and tone, and length of body and shortness of legs, to the miserable system of breeding a pretty-looking horse, with anything but a long body and anything but short legs! If the animal has a small head and a tolerably thin neck, which he curves in a dignified manner, public taste appears to be quite satisfied. Now this state of things ought not to exist; and with a proper association of veterinary science with agriculture, it could not exist. Take, again, your stock. I grant that you have done a great deal in that respect. Your horthorns are

a marvel. At every periodical inspection I find them advancing; and we have here, perhaps, the most astounding instances of progressive development which natural history furnishes. It appears from the remarks of M. Girard, who was in his day a scientific man and a close observer of cattle—I am speaking now of French cattle—a good animal had in his day its permanent teeth well up and its dentition perfected at the age of five or six years. I constantly find Shorthorns with full dentition under three years of age. The attainment of perfect dentition is, I need scarcely say, a proof that the animal has reached the period of maturity. In the case of sheep we have advanced a year, and in that of pigs a year and a half. The pig, which used to require three years, has now perfect dentition and full bodily development at the age of eighteen months. This shows what can be done when a certain thing becomes advisable, and attention is directed to it. It seems a strong fact in support of Mr. Darwin's notion that you can almost do what you like in such matters. Pigeon fanciers tell us that they can breed to any particular colour that they wish in the feathers, and what has been done in the case of pigs affords a strong presumption in favour of that theory. But remember that where you have precocity of development there is a corresponding want of tone in the system. It appears to be an invariable law that that which is quickly produced shall not long continue. Hence, it is that these animals which you have succeeded in breeding in such wonderful perfection within so short a period are remarkably subject to disease. You will rarely find the lungs of a sheep two years old free from organic malady. Such animals are constantly exhibiting in the internal organisation tape-worms, and hydatids almost without number. Moreover, the problem has yet to be solved what particular kind of food is best adapted to sustain the animal's body, and to bring it to early maturity without any unnecessary loss of its tone or of nutritive properties. I do not stand here to tell you that a sheep of the age of five years would be much better food for the people than a sheep of the age of one year. I should consider that I was rather trespassing on your patience if I did more than allude to what is so palpable. But the question is, not which animal is best for the market, but which will pay best, commercially speaking (Hear, hear). It would be altogether unreasonable and absurd to expect the farmer to keep his sheep up to the age of four years, merely that people might have better mutton (Hear, hear). Of course, one would always prefer four-year to one-year-old mutton; but one is tolerably contented so long as the mutton supplied is in a healthy condition. It is admitted that the presence of sheep on the farm is a necessity of English agriculture; in fact, our system of wheat-growing, in connection with turnip husbandry, is dependant on that animal. But the question for the agriculturist to decide is how long the animal may be most profitably kept? My own opinion is, that, as they are at present bred and fed, if the growing flocks of the country were retained two years instead of one, the loss to the farmer would be irremediable, and the per-centage of deaths terrific (Hear, hear). Knowing what I do about the condition of such animals about the age of one year, which may be regarded as the term of tolerable maturity and general development of the bodily system, I hold that with the same method of feeding—I mean feeding largely upon roots containing an enormous per-centage of water, and tending to produce a flabby and loose condition of body—the animals would suffer seriously if they were kept much longer. While the present system of

feeding exists, no remedy for the evils which accompany it can be suggested. But against the system of fattening animals I wish to enter my strongest protest. The object of agricultural exhibitions should be to encourage the development of the most perfect forms of animals, not to create a large amount of fat; and the animals which I see from year to year are far from satisfying me in this respect. I observe more and more fat laid on, apparently for the purpose of concealing defects; and I regret to be obliged to say of the judges, some of whom probably are present this evening, that they are in some degree responsible for this (Hear, hear). I do not know whether it is really the case that they judge favourably according to the amount of fat upon an animal's body, but I do know that breeders generally are under the impression that they do so (Hear, hear). Breeders say, "It is no use sending that animal to the agricultural show, it is not fat enough for that purpose!" That is language which ought not to come from the mouth of any breeder in the kingdom. In examining the internal organisation of animals which have died, I have found, in many cases, fatty disease of the liver—a disease which it might well be supposed was confined to men who loved to gratify their taste for turtle-soup, and other things containing a large quantity of oleaginous matter. I have found this disease not only among stock, but even among horses and cats. It exists, I believe, at the present time among horses, cattle, sheep, and calves, to an enormous extent; and the presence of such a disease as fatty liver proves that there is something essentially wrong in the present system of feeding, and suggests the importance of proceeding on regular scientific principles, which though they may be imperfect, are nevertheless, as far as they may go, tolerably well defined. Well, then, having to consider the stock on the farm as subject to disease, one of course naturally regrets being unable to suggest any means by which the veterinary art could materially assist the agriculturist. In the case of the horse one starts with the grand fact that the carcass of the animal is worth nothing at all, so that it must always be worth while to attend well to his health. His value being, say, £10 when living, he will perhaps only be worth as many shillings when dead; and hence the veterinary art has a much wider field in relation to horses than in relation to cattle. When an animal is affected by epizootic disease, or any disease that is likely materially to reduce the animal's condition, the first question that arises in his mind is, "Will it answer my purpose better to consign this animal at once to the butcher, or to take the chances of a treatment which will probably be successful, with a certain loss of condition?" and I am hesitant enough to say that I think it generally answers his purpose to send the animal to the butcher. [MR. CONGERN: "There can be no doubt of it."] I must say conscientiously that I have never been able in such cases to suggest the propriety of medical treatment, because of that unfortunate circumstance the certain loss of condition. If you get a valuable hunter back from the veterinary surgeon a mere bag of bones, but with sound wind and limb, you know perfectly well that a certain amount of care and keep will restore him to his former condition, and the result is that you are satisfied, and the veterinary surgeon obtains the credit of having achieved a good cure. On the other hand, if a fattening ox loses all that he has gained during six months, and it takes six months to bring him to his former condition, the veterinary surgeon gains no credit, and at the same time you are considerably at

of poont; therefore I do not think farmers show any want of a due estimation of the veterinary profession when they decline to submit their animals under such circumstances to medical treatment, or can be blamed for not keeping their animals without such treatment in a condition of disease which necessitates a loss of bulk. But I do blame them for not consulting the veterinary surgeon more frequently than they do, when their animals are threatened with disease (Hear, hear). The outbreak of smallpox in Wiltshire during the last summer afforded a splendid illustration of what may be done by combination. The alarm having been sounded, the agriculturists of the district combined, proper precautions were taken, the bodies of the infected sheep were buried, and thus the range of the disease was limited. I shall always point to that as a convincing proof that agriculturists by associating themselves with veterinary science, and acting together as one man, may do a very great deal towards the prevention of disease (Hear, hear). I cannot add, for it is not my opinion, that veterinary science can do a great deal for animals which actually are diseased. But here arises a very important question. When the question is whether it is better to consign an animal that is diseased to the butcher or to subject it to doubtful medical treatment, I say at once consign it to the butcher. But there ought to be some restriction as to the condition in which the animal should be so consigned, and it is, I think, for veterinary science to define that condition. There ought to be some kind of certification that the animal was not unfit for human food. It would be perfectly absurd to imagine that all diseased animals are unfit for food. There are plenty of diseased animals that would not repay one for medical treatment, and of which, nevertheless, one would not object to partake. There are plenty of cases of local disease in which the animal affected may unhesitatingly be consigned to the butcher. But, on the other hand, there ought, I repeat, in all such cases, to be a certificate of fitness for consumption. A large number of animals which are not fit to be sold as food are constantly being sent into the market. Some time ago, wishing to obtain some subjects for examination, I sent to a large butcher for them, and I received back five or six animals which, though in a bad state of rot, were dressed for the market. I have also been told by an individual that between the town where he resided and London he had within the space of six months killed no less than 750 animals in a state of extreme disease. I believe these animals were all sent to market. Can one doubt this for a moment? What becomes of all these rotten sheep? We see hundreds and thousands of them alive—what becomes of them when dead? To bury them would require whole catacombs; the real catacombs are the intestinal canals of the human body. We hear of the small-pox, scarlatina, and typhoid fever prevailing among the poor; and can we wonder at it, under such a state of things? No one can suppose for a moment that this evil ought to be allowed to continue. As I have before intimated, I think the chief use of the veterinary science is in prevention. How far a regular system of attention to the health of stock can be carried out practically it is not my province to suggest. I do not know whether or not the system which prevails in China with regard to the medical profession would answer in reference to English stock. It is said that in China it is customary for the patient to pay his doctor as long as he is well, and for the doctor to pay the patient when he is ill (laughter). Whether that system would answer in this country in reference

to the sheep and oxen I do not pretend to say, but I am convinced that the re-establishment of the original connection between veterinary science and agriculture would be exceedingly beneficial to farmers. I feel confident that their disconnection has been a great evil, and I advise you, gentlemen, to endeavour to restore the connection as soon as possible. For this purpose I would remark there can be no question that the commencement of education is the point at which right principles should be instilled. I do all credit to the agriculturists of the day. They present to me a spectacle which is without a parallel—the spectacle of men who, after having laboured for years and secured the comfort and luxuries of life, in the enjoyment of which they might well be contented to rest, come from their homes to take part in practical and scientific discussions on agriculture, and devote all their efforts to the improvement of a system of which they are able exponents (cheers.) But while I give full credit to such persons, I contend that there is yet much to be done for the rising generation of farmers. There remains still to be established a sufficient number of schools and colleges for the education of that class of society. After more than a dozen years' experience in relation to agricultural teaching, I believe the system has yet to be discovered which shall meet the requirements of the time. We want more of practice and less of theory. It is a very deliberate conviction that the lecture system is not adapted for compulsory tuition. It is sufficient for those who desire to learn, but not for those who do not; and among the rising generation of farmers are to be found a large proportion of those who do not feel the necessity of learning. I believe that the only system of instruction which is likely to prove effectual is that which is carried out in some of the medical schools in London, I mean the system under which a young man is required not merely to learn a thing, but to do it (Hear, hear.) We want more schools and colleges in connection with agriculture. That there should be only one agricultural college is, I think, a reflection on the whole kingdom. There should be a dozen colleges, altogether disconnected with ordinary school teaching. You cannot in one part of the day treat pupils as men and in the other part as school-boys: the ordinary education should be firmly fixed before youths are sent to an agricultural college, and when they are there their attention should be directed to the science and practice of farming. I have often been struck with the enormous extent of information collected in practical classes, compared with that which has been obtained in the lecture room. Let me add that there can be no question that by the institution of schools and colleges, by the establishment and extension of such Clubs as this, by occasional lectures, by the inspection of stock in different parts of the country, and by a general combination of interests, you will best solve the question how we may draw closer the relation between the veterinary art and agriculture. The two things were, as I have before said, originally connected, the one arising naturally out of the other, and their disconnection must be injurious alike to both (cheers.)

Dr. VOHLCKER said they had heard a good deal that evening about fatty degeneration and an excessive deposition of fat. Now, as fat could only be deposited from fatty matter contained in food or materials analogous to fat, he presumed that what the Professor referred to was excessive feeding with fat-producing materials. He was sorry to say that he differed from his former excellent colleague on that point. Speaking chemically, he believed that the great practical mistake in the

art of feeding was, the excessive supply not of fat-producing, but of flesh-producing materials. He had been perfectly amazed to find, in the public journals, no mean authority in agricultural matters recommending the use of as much as 28lbs. of oilcake (Hear, hear.) In oilcake there was something like 30 per cent. of flesh-forming substances. If they looked at the food of ruminating animals they would find that an immense supply of plastic elements, as Liebig called them, or flesh-forming materials, was not necessary. Hence the advantage of giving animals highly nutritious substances, such as oilcake, beanmeal, and richer kinds of food, generally considered heating, with straw, chaff, or even meal, which possessed non-heating properties. He thought a great practical mistake was made at the present time in the art of feeding, in the excessive supply of nitrogenous food. He could not understand, speaking chemically, how even 10lbs. of oilcake could be assimilated with any advantage to the animal, or without deteriorating, in some way or other, its constitution (Hear, hear.) They had been too much in the habit of regarding an animal as a manure-producing machine. Certainly it was a manure-producing machine, but only to a certain extent. They must not make the ox, or any other animal, merely a machine of that kind (Hear, hear.) They could not feed even a thrashing-machine so as to overload it, without doing it some injury; and by giving cattle 10lbs. of oilcake, which was considerably below the quantity sometimes given, they must injure them. This was not an opinion expressed at random; he knew as a fact that injury was done by an excessive quantity of cake, and especially cake that was rich in nitrogenous matter. It happened in the case of linseed cake that the nitrogenous matter was associated with an oil which was well known to possess laxative properties that took away any injury. But when they gave any other description of cake however, good it might be, in which the nitrogenous food was not associated with medicinal linseed oil, injury was done. In his practice cases had continually occurred in which the stomachs and intestines of animals had been sent to him, with a request that he would examine them and see from what cause they died. He could find none; but on inquiry he found that the mischief arose from an excessive supply of cake which was exceedingly rich in nitrogenous matter, especially nut-cake and cotton-cake. [A VOICE: Decorticated cake?] Yes, and it was remarkable that the decorticated cake, which did not act mechanically, like cake which was made from the whole seed, and having the shell on, might be considered red indigestible. The pure decorticated cake, the genuine, highly nutritious article, in many cases produced serious mischief. He therefore differed to a considerable extent from his colleague in the supposition that it was an excessive supply of fattening food that produced disease in cattle; he was rather inclined to think that it was an excessive supply of nitrogenous food. According to this view, 5lbs. of cake of a good description was about the maximum quantity that ought to be given to an animal; all above that he considered calculated to do more harm than good (Hear, hear.) That was a point of considerable practical interest, and therefore he had ventured to bring it before the Club. On other points relating more particularly to the veterinary art, he must keep silence.

Mr. L. A. COUSSMAKER (Westwood, Guildford) said he agreed with Professor Brown, that agriculture had not yet sufficiently availed itself of the veterinary art. In counties where the superior breeds of cattle prevailed there would be

found valuable professors of that art; but in many parts of the country, including his own district, farmers could generally only employ ignorant men calling themselves horse-doctors and cow-leeches, and who often did more harm than good. Such persons farmers were very loath to call in. When there was anything the matter with their horses they preferred relying on common sense, a few simple remedies, and Dame Nature. When their cattle were diseased they cut their throats (laughter). It was a very simple but an efficacious remedy, and was found far preferable to the cow-leech with his long bill. He recollected that some years ago Professor Coleman said that when in practice as a veterinary surgeon in London he thought he should like to know something about the London dairies, not wishing to confine his attention to horses, but to extend it to cows. Accordingly he called on several owners of large London dairies, and, announcing who and what he was, told them that if there should at anytime be anything the matter with their stock and would send for him he would give them the benefit of his advice and charge them nothing for it. Weeks and months rolled on, but he was never sent for. At last he called on some of the dairymen again, and, after reminding them of his former visit, said I am afraid you did not understand me when I said that I would give you advice without charging you anything for it. "Oh! yes," was the reply, "we perfectly understand what you said; but we have found by experience that it does not do to doctor our stock. If anything is the matter with the animals there is always a price to be got for them in London, and we cut their throats" (laughter). Consequently, Professor Coleman could not obtain an opportunity of seeing what he had desired during his practice in London. With regard to early maturity, it must be admitted that where that was the main object animals were not so healthy as they might otherwise be; but early maturity was what answered their purpose best, and he did not think they were at all to blame in the matter (Hear, hear). With regard to the quantity of oilcake which could be given advantageously, he fully agreed with the last speaker. By giving too much cake and endeavouring to fatten their beasts too quickly, many farmers had defeated their own purpose. Had they given only a less quantity of oilcake with a greater mixture of other food, the animals would have done better and would have paid better in the end (Hear, hear).

Mr. J. THOMAS (Bletsoe, Beds) said: As regarded the ordinary cow and horse doctors, there could be no doubt that a great deal of mischief had been done to stock by the employment of persons of that description. These men were generally perfectly uneducated; and though they professed to know a great deal, they scarcely knew anything. Whenever a veterinary surgeon was to be found within a distance of five, six, or even ten miles, he (Mr. Thomas) would prefer sending for him to employing such persons; and when he could not get one, he would rather rely on his own judgment and experience than have recourse to them. Unfortunately he now lived something like eight miles from a veterinary surgeon; but he found that it answered his purpose to employ him, paying him so much a year for his attendance, and he felt great satisfaction whenever the veterinary surgeon came to see his stock. He felt great confidence in him, believing that if anything could be done for any of his stock when out of health, it would not be wanting. The gentleman to whom he alluded was Mr. Dickens, of Kimbolton, who was, he believed, well known to most persons connected with the veterinary art. As regarded Professor Brown's remarks, it

reference to hacks, he (Mr. Thomas), was very sorry that the old-fashioned hack, with which he was familiar when a boy, 20 or 30 years ago, seemed to be almost extinct. People had paid so much attention to the breeding of thorough breeds, that they had now lost that beautiful animal which was the pride of this country. He did not agree with the Professor, however, with respect to the breeding of hunters; on the contrary, he thought they could get as good a hunter, and one that would last as long in a fast run, for money now as was to be obtained at any period within the memory of the present generation. He concurred in a great measure in the remarks of Professor Voelcker, more particularly in reference to Alderman Meehi. Although he had read it in print, yet he could not help thinking that the Alderman must be too good a man of business ever to have really said that 28 lbs. of oilcake might be usefully given to an animal (Hear, hear). It was impossible for any man of common sense to suppose that that was a proper quantity. He agreed with Professor Voelcker, that 5 lbs. of cake was enough, and thought that if more was given it would be disadvantageous. With 5 lbs., 4 lbs., or even as little as 3 lbs. of linseed cake, he would give wheat meal, which would, he believed, be found cheaper than anything else for animals, whether cattle, pigs, or sheep, at its present market value; and he maintained that 10 lbs. of cake could not be given with a view to profit.

Mr. W. VIVIAN (Trencon Villa, Haverstock Hill, London) wished to set the Club right with regard to the observations of Alderman Meehi, in reference to the use of 28 lbs. of oilcake. Those observations were made, he believed, in Cumberland, and what was said about the oilcake was in the form of a quotation from a remark made by a friend of the alderman. The alderman was alluding to a visit which he paid to a gentleman in Norfolk, who farmed under the Earl of Leicester. In going over the farm, his eye lighted on some beasts that were grazing in a field, and the farmer told him, he said, that he had given those animals 28 lbs. of oilcake. Mr. Meehi added—"Mind, gentlemen, I don't give my beasts 28 lbs.: I am merely relating to you what was said to me by a gentleman who farms 1,200 acres." It was, therefore, an error to suppose that the alderman said he had given his own beasts 28 lbs. of cake, or that he recommended others to do so (Hear, hear).

Mr. H. CORBET wished to attempt, for a moment, to turn the subject into a fresh channel. Was "the veterinary art in relation to agriculture," he would ask, properly a breeding or a feeding question? (Hear, hear). According to his notion, it was more the former than the latter. If they had an overfed ox, a turkey, or pig, the best thing they could do was to cut his throat; but if they had a thorough bred stallion, a good bull, or anything of that kind amiss, they should at once send for the veterinary surgeon. He was, he confessed, almost sorry the subject had not been introduced by a farmer, who would have told them what he required under such circumstances. He (Mr. Corbet) believed that what the farmer wanted was a veterinary surgeon, especially in relation to the more valuable portion of his animals, namely, his breeding stock. There were not veterinary surgeons enough. How were they to get more? Why by giving them more work. How were they to give them more work? By giving them a better introduction—an object which might be secured by the various agricultural associations throughout the country (Hear). In his opinion every district society should have a recognised veterinary surgeon attached

to it (Hear, hear). He had sometimes the honour of acting as a judge at country shows. The first question which he asked when he went into the yard was, "Have you a veterinary surgeon?" The reply generally was, "We have not, but we can get one"; to which he replied, "Get him, then." A veterinary surgeon had a recognised status; and if all the judges in England were to swear one thing, and a veterinary surgeon were to swear contrary, depend upon it in nine cases out of ten the local gentlemen would go with the surgeon. He thought that one of the primary duties of the agricultural societies of this country was to recognise the veterinary art. Thus far it had been recognised only in a very inadequate degree. Even the Royal Agricultural Society kept the veterinary profession at arms'-length as long as it could do so; but the preliminary examination had now been found of very great value. Veterinary science was, in fact, of great importance as regarded the breeding of stock. Professor Brown had told them some curious things about fat mutton, but he did not think that was exactly the point which they had to consider. Supposing they gave a prize for a horse or a bull, what was the effect of that? It was not the mere value of the £5 or £10, but the prize stamped the animal as being a description of stock the breeding of which might be advantageously encouraged and extended (Hear, hear). If they had not a veterinary surgeon to step in and condemn "on authority" hereditary unsoundness where it really existed, they might go back, and give a prize for a horse that was a roarer, or an over-fed bull which could not get stock, thus doing great injury to the cause of agriculture. He maintained, therefore, that the relation of the veterinary art to agriculture was to be looked for, not so much in connection with fat stock as in connection with hereditary principles and with breeding; and he repeated that the best introduction for veterinary surgeons should be made through the various agricultural societies (Hear, hear).

Professor COLEMAN (late of Cirencester) said that in most of the remarks of the last speaker he entirely concurred. He regretted that Professor Brown did not allude to hereditary disease or tendency to disease. There was not much use in veterinary inspection at shows, or in deciding there that an animal was unfit for breeding purposes, unless the inspector could prevent disease from being developed by inspection and advice on the farm. Professor Brown had laid down that evening an axiom from which he (Professor Coleman) dissented, namely, that the animal which was quickly produced could not long continue. That it did not long continue, as a rule, he granted; but might not that be owing to improper treatment? The animal was removed from its natural condition and supplied with artificial food, and disease followed; but he would ask the Professor whether it may not be possible to produce stock rapidly with a prospect of considerable longevity? Take, for example, the sheep. At the present time every sheep was fed almost from its birth with artificial food, and was supplied with what was adapted to develop the whole of the frame as rapidly as possible. Suppose animals brought up in that artificial manner, and intended for breeding stock, were suddenly placed in most unfavourable circumstances; suppose they were put on damp soil, or left standing in water, and were fed with an enormous quantity of weak watery food; was it not an absolute certainty that the delicate organisms of those animals would suffer? Was it not due to unfavourable circumstances, and to an unsuitable method of treatment? It seemed to him a point of consider-

able importance that a large amount of disease was engendered by improper treatment, and that it became so hereditary and extended, that now they could hardly find a sheep which had not more or less of disease in the lungs, or some other delicate part of the animal organism. With regard to the amount of oil-cake that might be properly used in feeding beasts, he could quite agree with a preceding speaker that Alderman Machi had been misunderstood, having spoken, on the occasion referred to, not of his own practice, but of a friend's (Hear, hear.) He (Professor Coleman) would ask, was it not possible for the farmer to avail himself of the veterinary art by occasionally employing a veterinary inspector to look over his stock, and thus prevent rather than curing disease? He had no wish to reflect on the intelligence or knowledge of the agricultural body, but it was not reasonable to suppose that they had time to study the constitution and physiology of animals; and he believed that if there were periodical inspections of stock by properly-qualified persons, who would converse freely with the farmers in reference to breeding questions, excellent results would follow.

Mr. P. H. FRERE (Cambridge) said medical science divided itself into two branches—the recognition of the signs of disease, and the mode of treatment; and when the services of a veterinary surgeon were obtained at an agricultural show, they were applied only to the former. Great progress had been made in the diagnosis, or the recognition of the symptoms of disease, during the last fifty years, but he much doubted whether there had been equal progress with respect to the *materia medica*, or knowledge of the treatment required. The change consisted more, he believed, in the discarding of the old purgatives than in the introduction of anything on the positive side; although they had materially gained by the use of iron and other valuable tonics. Perhaps the medicines of the new school of Homoeopathy afforded the farmer the most hopeful prospect. Professor Brown having stated that he despaired of successful treatment of pleuro-pneumonia, he would ask him what there was peculiar in that disease to distinguish it from lung disease in man? He believed that if a young man of good bodily frame and constitution showed only the threatenings of lung disease, or even if, through some accident, he were attacked for the first time with inflammation, the medical faculty would say that he might be brought round successfully by very plain and simple means within a short time; and he wished, therefore, to know what distinction there was between the lung disease in man and the lung disease in cattle, which drew a broad line of demarcation between them? Again, the professor said he believed there was so much unsoundness in their improved breeds of sheep that they could hardly expect animals to live beyond the age of two years. He would ask him whether that remark was applicable to a flock of breeding ewes? So far as his observation extended, such animals lived to a good age, the deaths amongst them being remarkably few, except at the period of breeding.

Mr. J. WOOD (Ockley, Hurstpierpoint, Sussex) was astonished to hear Mr. Brown state that the greater part of the sickness and mortality which had occurred among the community this year arose in some way from what was contained in the animal food which had been consumed. It was possible that such was the case, but farmers had never been in the habit of considering that there was any injury arising from the consumption of sheep which had acquired a certain state of rot; on the contrary, when they had any doubtful sheep, they had thought that the best course was to let them

fatten, and they had thought there was nothing wrong in sending them to the butcher, and would have no objection to consume a portion of the meat themselves; that had always been the practice in his district, and he knew it had also been the practice in the western counties, particularly where there were good water-meadows. In such cases farmers did not feel any objection to sending the old ewes into water-meadows, and letting them fatten for the market. He was pleased to hear Mr. Corbet restore the question to the practical shape in which it was prescribed on the card, as they were previously rather wandering from the topic of "veterinary art in relation to agriculture." He would be glad if the agriculturist were placed in a position to avail himself of the advantages of the veterinary art to a greater extent than he could do so at present. He doubted whether anything was to be expected from agricultural societies, as regarded the veterinary art. Even the Central Farmers' Club did not make that progress which, as an old member, he thought it ought to make; and as to the agricultural societies throughout the country, why their meetings had generally dwindled down into political meetings rather than anything else, or occasions when the clergyman of the parish had an opportunity of glorifying himself (laughter). Such was certainly the position of many of them; and he must say that he, for one, had no great hope or faith in agricultural societies as instruments in advancing the introduction of veterinary surgeons. He should be glad if some means could be devised for enabling agriculturists, who might wish to do so, to obtain the assistance of a veterinary professor. He had no reason to complain as regarded his own district. Although the man whom he employed had not the certificate of the college, he had had a good deal of experience, and common cases of fever and inflammation he was, he believed, competent to deal with. He also cut his colts and pigs—a task which he supposed a veterinary professor would not condescend to perform. What was, he thought, especially desirable, was access to a veterinary surgeon who might, when necessary, examine stock, and whether there were any means by which the outbreak of disease might be prevented. Were societies formed, which by means of a subscription would secure the periodical aid of a veterinary inspector, that would, no doubt, lead to very great advantage, and if that discussion should result in anything of that kind, thereby introducing veterinary professors into the agricultural districts generally, it would have rendered great service to farmers (Hear, hear).

The CHAIRMAN said, before the discussion closed he wished to make one or two remarks. In the first place, he must say he was rather struck by the Professor's remarks with respect to dentition. If he understood him aright, he said that some years ago pigs only showed their full mouth at three years of age. Regarding full dentition as a sign of maturity, he observed that, whereas pigs formerly became full-mouthed at three years, they were so now at eighteen months; and that, whereas cattle were formerly full-mouthed at five years, they were so now at three. He should like to hear from the Professor how it was that horses remained the same as they were in that respect? As long as he could remember, a horse had a full mouth at five years, and that was the case still. Surely it could not be said that horses had received less attention in breeding than cattle. Perhaps the Professor would be kind enough to explain the difference.

Professor BROWN then replied. After observing that a full reply to the questions put to him would require a course

of lectures, he said Dr. Voelcker, who commenced the discussion, dissented from his opinion that the great feeding error of the present day was the consumption of fatty instead of flesh-forming materials. Perhaps, after all, they only resembled the knights who fought behind the shield. Did the Doctor consider oilcake nitrogenous food?

Dr. VOELCKER: Yes.

Professor BROWN said, well, he did not (laughter). He referred to the fat it contained, as producing disease.

Dr. VOELCKER said he, on the contrary, thought that the oil was a remedy, and that the animals would be worse if they had not the oil (Hear, hear). He did not know any food that was more calculated to keep an animal in good fattening condition than barley-meal. Now in barley-meal the proportion of the nitrogenous to the non-nitrogenous, or fat-producing, materials was 12 in 100; while in oilcake the proportion was as much as 28, 30, and even 60 per cent. Even taking the lowest figure, there was more than double the quantity of nitrogenous matter in oilcake than there was in barley-meal. They all knew what was the effect of consuming an excessive quantity of meat. If they began to regulate their diet so as to take every day fish and roast beef, and birds to finish up with, they would soon have gout. Hence it was necessary to take a good deal of bread, to counteract the effect of an excessive quantity of nitrogenous food. How were they to prepare an animal for a cattle show? Not by giving it oilcake only, but by giving it also mangold and sugary food; and the animal consumed far more food when left to a choice of non-nitrogenous substances, than when confined to oilcake. He did not think a large amount of oilcake produced injury. On the contrary, he repeated that he regarded the oil as a remedy, just as he considered a dose of castor oil useful, if his boys had eaten too much plum-pudding (laughter).

Professor BROWN said he had not the slightest doubt that his colleague was entirely wrong (laughter), though, unfortunately, he had not time to show how he was wrong. In the first place it was not a mere question as to the actual percentage of fattening materials which should be given, whether in starch, sugar, or oil, but the question was what percentage of those materials was in a fit state for assimilation. If they gave two quarts of linseed-oil per day mixed with any amount of barley-meal, or anything else, they would very soon convert the animal into a skeleton, because they would keep him in a continual state of diarrhoea. He had no wish to trespass at all on the province of chemistry. As a pathologist he found an animal with a fatty liver, and he said that animal had had too large a quantity of fatty material in a condition for assimilation; he left Dr. Voelcker to find out what material it was. He did not know whether oilcake alone produced disease. People sent him livers, but did not send him their method of feeding. He knew, however, that many dealers in the country were in the habit of feeding their horses on oilcakes to a large extent, and he had been astonished to find the presence of fatty disease in the livers of horses. He might call to Dr. Voelcker's recollection the case of the well-known Strasbourg geese, the livers of which were converted into a mass of fat, every cell being destroyed by the forced passage into the stomach of some fatty kind of food.

Dr. VOELCKER said the geese were fed with Indian corn. Persons put them between their legs, and in that position—

Professor BROWN said his object in referring to that case was to show that if an excess of fatty matter were supplied

disease would ensue. As regarded the question of early maturity, he had intended to express his conviction that animals which were rapidly matured did not practically possess the same amount of tone in the system as those which were matured slowly, and he suggested for consideration whether it were not a natural law, and matter of common observation, that animals which were produced rapidly had not the requisites for continuance. As to hunters, he (Professor Brown) did not deny that there were good hunters, but the question was why there were so many bad ones? He did not see why a good hunter and a good hack should not be the rule, and a bad one the exception, as must be the case under a proper system. Mr. Corbet, who deserved the thanks of the veterinary profession for what he had said respecting it that evening, thought that the question under consideration had more to do with breeding than with feeding. It was a question of health. It was impossible to keep animals in a healthy condition without considering the influence of diet, and it was part of the duty of the veterinary surgeon to see that the stock did not feed on what would injure them. In what Mr. Corbet said in relation to hereditary disease in breeding, he cordially concurred, and he thought it well worthy of the consideration of agricultural societies. Professor Coleman raised the question whether an hereditary tendency to disease was not consequent on improper selection of animals for breeding purposes, and suggested for consideration, whether an animal that was rapidly matured might not be so treated as to secure the requisites for a considerable continuance. The only answer he could give was, that the animal would in fact cease to be valuable under such circumstances. The sheep would no longer be valuable on the farm when it could not be left on the turnips. If he were bred like a hot-house plant, and by being used for turnip-husbandry, was exposed to changes of temperature, it could not possibly be maintained in a healthy condition. The sheep was naturally a hardy animal. Alter his condition, breed him so that his tissues were rapidly developed, house him carefully like a flower in a green-house, and he ceased to be valuable. He did not, indeed, doubt that sheep might be kept for any reasonable period under those altered conditions. Mr. Frere thought that the science of the diseases of animals was in advance of the science of treatment. The one must precede the other; but when they had discovered all that was to be known in reference to the elements of disease, they would have advanced very far indeed. One aim of the scientific mission of the present day was to do very little, or to avoid violent interference with the system. In reply to Mr. Frere's question respecting pleuropneumonia, he wished to say that it was not an inflammatory disease at all, and that there was never any threat of its attack. An animal showed symptoms of the disease for the first time on a particular day, and on its being killed it was discovered that the disease had existed for weeks. The disease was in the blood, the animal being in a rheumatic condition, and probably arose from that excess of nitrogenous food which was undoubtedly the cause of splenic apoplexy. The obscurity of the disease was the reason why there was such a great difference practically between pleuropneumonia in cattle, which was entirely referrible to the blood and the inflammatory disease in man, which was quite local. The longevity of breeding ewes he did not dispute; but, then, it should be recollected that they were placed under more favourable circumstances than other sheep, the object not being to drive them to early maturity, as in the case of tegs, which

were sent to the butcher as soon as possible. As regarded dentition, the Chairman asked him why it was that horses always had their teeth fully developed about the same period as formerly, when there had been such an advance in the case of pigs. He replied, first, that horses undoubtedly received closer attention at an early period from sporting men than cattle did from farmers, and hence obtained a proper status earlier; secondly, that the assumption of the Chairman was not quite correct, inasmuch as many horses have their permanent teeth long before they are five years old. He could show them a hundred different horses in different parts of London that had them soon after four; and he scarcely ever looked at what was called a five-year-old mouth without suspecting that it was but a little over four. Four-year-old horses were constantly being sent to London with the teeth

fully developed. The discovery of the fact was easy, by examination of the back teeth.

On the motion of Mr. J. Williams, seconded by Mr. T. Congreve, a vote of thanks was awarded to Professor Brown; and on the motion of Mr. J. Thomas, of Bletsoe, seconded by Mr. Reynolds, a similar acknowledgment was made to the Chairman.

At the Monthly Meeting of the Committee, on Monday, November 2nd, Mr. Thomas Congreve, of Leamington, Hastings, Rugby, was elected Chairman of the Club for 1884.

Mr. John Bradshaw, the Chairman for the present year, intending to spend the winter on the Continent, Mr. Henry Trethewy was elected Chairman for the remainder of Mr. Bradshaw's term of office.

SPECULATIONS AND SUGGESTIONS.

Real practical men of business are not often speculative. The straightforward plodding man is generally the most successful. Scheming, speculative men are useful pioneers, but not the right men to follow up in every-day life. Generally speaking, they are seldom contented with the attainment of to-day. Something must open out before them. They must try this and try that; and, unless the experiment has been determined upon with careful thought and consummate judgment, in nine cases out of ten the result is a failure. But this is the age of experiment. We have continually before us "some new thing"—real or supposed. Modern agriculture teems with new novelties, particularly in modes of farm management. We have new breeds of our domestic animals; new varieties of grain, seeds, roots, vegetables, &c.; new implements, new machinery, new manures, new preparations, and new kinds of cattle food; new courses of husbandry, new orders of culture, new modes of rearing and fattening stock, &c., &c. Besides all this, we have new ideas of the right management of our workmen, of our households, of our families, yes, and of ourselves too—the modern farmer. Everything is new; everything has undergone, and is undergoing a change—a great change. We live in extraordinary times. We must live up to them. All things denote activity: some move with wonderful rapidity. How are farmers to keep pace with these times? Progression, rapid progression, is the law of the age. The world is travelling at railroad speed; communication is opened everywhere; Europe is almost an integral part of Britain; America is within a nine days' transit; all countries vie with each other in providing for the British market: thousands of live stock are weekly poured into our ports, and tens of thousands of quarters of grain and cwts. of other produce are daily landed in our storehouses. How, then, I again ask, is the British farmer to keep pace with the times? How is he to meet all this competition—this activity—this application of knowledge and skill in forcing production and husbanding supplies? How is he to compete successfully with the world's industry, the world's agricultural economy, the world's facilities of culture, the world's markets? This is a problem not easily solved.

With the permission of my readers, however, I intend to occupy a short space in speculating upon, or in suggesting courses which must ultimately be adopted and efficiently practised if British farmers are still to head the nations, and keep their place as the most enlightened agriculturists in the world.

The modes of farm management are new. We no

longer pursue the practices of our forefathers: we rather repudiate them. Now it is as requisite to have a character or pedigree with the grain and seeds to be sown for cropping as with the male animals for breeding. The varieties of wheat and other grain have become a study—a matter of universal inquiry. The suitability of the variety to the site and fertility of the land is now, and will be, a positive requirement. The adaptation of the different breeds of stock to soils, localities, and climate is now the subject of many a theme and many a speech. It is the study of every enlightened breeder and grazier. Then, the conduct of farm operations is altogether modern. The manner of culture is new. The plough, that most ancient of all ancient implements, is nearly superseded; the cultivator or scarifier doing most effective work, and a four-fold amount of it. The land is continually undergoing either surface or deeper (*i. e.*, subsoil) culture. The hoe or the scarifier is at work with but short intervals throughout the year. This system is almost universal, *i. e.*, it is continuous culture as far as practicable. Autumn culture is general: steam-power alone is destined to make it universal, and they work still more surprising wonders in cultivation.

The great problem to be solved, the great fact to be realized in our agriculture is, so to enhance production that no amount of competition can injure us, so that we can undersell all competitors in our own markets; so that we can take the lead in the world's markets, and supply them with what British skill has achieved in the improvement and introduction into its agriculture of the new varieties of grain, seeds, roots, vegetables, fruit; of the new breeds of horses, cattle, sheep, pigs, poultry, &c. And can this be done? I answer yes, I believe it can, and I believe it will be done. Look at the condition of our agriculture, the size and security of our holdings, the capital engaged, the skill and enterprise of our farmers, the freedom of culture and of cropping, the improvements of our tillage implements and farm machinery, the ready adoption of these improvements by our farmers, the rapid progress of steam-power as applied to our agriculture, the universality of subsoil drainage, the application of artificial manures, the skill and industry of our labouring population, their advancement in knowledge, and ready adoption of every known improvement likely to promote good husbandry and management. Then we have the numerous breeds of cattle, horses, sheep, pigs, poultry, &c., which are undergoing great and continuous improvement. We have breeds and cross-breeds without limit, and suited to

every climate and every country—breeds, the like of which is unknown elsewhere, so that I do not despair of superseding the nations of the world in their own markets; thus by an exchange of our valuable animals for breeding purposes, receiving in return their inferior ones for home consumption. But this can only be done by our onward progress; we must keep in advance of the world; we must stop at nothing short of a perfect agriculture, however unattainable it may appear. Forward, forward! must be our watchword, our order of the day. We must aim to supply the nations with our effected improvements at remunerating prices. We cannot afford to breed inferior animals, or grow inferior produce. We cannot successfully compete with these in any market: it is only by attaining and preserving our superiority that we can succeed. It is this, and this alone.

How then is this to be effected? how are we to keep a-head of the nations, seeing that our climate is so fickle and our soil so various and uncertain? By our skill, capital, enterprise, and industry. We must conquer our climate. How? By under-drainage on heavy soils, by deep cultivation wherever practicable, by aëration and exposure on others, by artificial-manurings and careful cropping on some; by choosing suitable times and seasons on others, by correct judgment in the management of all, and by the most careful and judicious selection of every kind of grain, seeds, roots, and vegetables to be sown or planted, with a right of choice of the precise time for sowing or planting; to which must be added the various orders of culture, and in this lies the chief feature or business. All must be done in suitable weather, or in a way equivalent. Steam-cultivation can effect it; it can do much work in a little time. We can do it without injury by treading; we can do it thoroughly, and just when you want it doing: it only, of all the appliances for culture, can do it; it only and alone can keep us ahead of the nations: it is the great desideratum, and it of necessity must be universally adopted. There is no other like aid for us. Steam-cultivation will be the most effectual means of enabling our farmers to keep pace with the times. But what of our grazing department? How are we to get up our animals with profit under such a wide competition? By correct breeding and management. Don't breed from an inferior animal: no, not if its pedigree be never so good. Keep all progressing from earliest youth to old age; never permit any animal to retrograde. Do not fatten on breeding farms, and do not breed on fattening farms. Be very liberal in artificial aids or foods. On fattening farms give cake or corn in plenty. The sooner the animal is fat the better, and cheaper in the end. Small profits and quick returns is the life of trade: why not in grazing? The grass lands might partake largely of the fold-yard manure: artificial may be substituted more advantageously on the arable lands. The more manure the more grass, and of more nutritious quality. The more grass the more stock, and the more artificial food; these add continually to the productive powers of the field, and consequently enhance production greatly. The proper mode and time for giving the rations of artificial food to stock is yet an open question; the kind of food is more settled, but much yet remains to be fully and satisfactorily executed.

I often look forward, and ask myself what bounds can be set to agricultural advancement. I know of no limit. I sometimes ponder and wonder what is to come next. I do earnestly want our little country to be made the most of. I desire it to be a pattern for the nations, not only in its political economy, as it truly is, but in its domestic and even its agricultural polity. I want every acre to do its utmost. Why, at present, our country is only "half-farmed." It is capable of far higher attainment, both in the arable and pasture departments. No country in the

world is better adapted to produce grass or root and vegetable crops; no population consumes an equal quantity of flesh meat. Here, then, is one great object of such attainment—to produce more animal food for man. I sometimes like to take a prospective view of the future, and, at the risk of being thought utopian, I will put down some of my fitful fancies. I take the education of our agricultural labourers. We require them now to understand the management of stock, and how to execute the various operations connected with ordinary farm management; but speedily we shall deem as indispensable a knowledge of steam machinery, and how to work it; of reaping and mowing machines, of grinding-mills, pulpers, cutters, &c.; of cultivators, scarifiers, drilling machines, subsoilers, &c.; and how to manage all after their new adaptations for steam-power or otherwise. We shall require them to guide the plough whilst riding upon it, and to reap whilst riding on the implement. The labourer will ultimately be more of the engineer than the workman; his employments will be more in the direction of implements and machines than in actual work—his work more intellectual, less laborious. In fact, he must be an educated labourer. Take the farm cultivation. This department of farm practice will undergo a complete revolution. Steam-cultivating implements will either plough, break-up, or smash up every acre of cleared land immediately after harvest, to receive atmospheric influences, and to be well worked as circumstances will permit throughout the year. All will, and must, be kept perfectly free from weeds. Every seeding will be got in just when most desirable, and culture will proceed according to requirement. This wonderful steam-power will almost effect the independence of the soil. There will be no loss of cropping from inability to get it in order. Steam-power aiding horse-power will always keep farm work in subjection to the will of the farmer. Then what fertility will be imparted! Deep cultivation will aërate the soil, and open and pulverize it to any reasonable depth. Artificial and ordinary manurings will then have full force; cropping will no longer lack nutrition, and immense produce will accrue. Then what crops! No bounds to the kind of crop, or the quantity to be grown! Corn crops without limit if required—root crops the heaviest possible, and oft repeated—seed crops whenever desired, and may be had without detraction or injury to the fertility of the land. In fact, with good drainage, a perfect pulverization, aided by unbounded manurings, a series of unheard-of, unequalled cropping may be obtained, simply from these aids and accessories to farm culture. Take the grazing department. These artificial aids to culture will permit heavy manurings to grazing lands; hence larger supplies of grass and seeds for stock. Every intelligent grazier will obtain or breed for himself the best varieties of stock for grazing purposes suited to his farm—cattle the most thriving, sheep the most prosperous and profitable. These must be admirably managed from their birth; no declensions permitted. Every aid to enhance their progress to full maturity must be given. Corn, cake, chaff, and condiments (well approved) without limit, in accordance with their healthy state. This mode carried out upon grazing lands and seeds will do wonders in summer grazing. But the winter supplies of roots and green crops will altogether outstrip summer grazing. The immense crops of mangolds, swedes, common turnips, coleseed, cabbages, and the like, to be fed off with large and liberal aids of these nutritious artificial foods, will yield the most surprising and profitable returns. Who can tell to what extent this system, this kind of management, may be advantageously conducted. Who can devise a better and more sure practice? What if all the barley, all the beans and peas, all the oats to be grown upon the farm should be thus consumed? Can any course

be more advantageous? It is merely converting the farm produce into meat and wool—in the present day by far the most profitable part of the farmer's business, and well demands his utmost attention. I hope for once those

who honour a "practical farmer's" papers with a reading will excuse him for this indulgence of a whim in thus writing for the future.

P. F.

THE DIETETIC AND MANURIAL VALUES OF LINSEED AND OILCAKE WHEN USED AS FEEDING MATERIALS.

There is something very anomalous in the opinions which many entertain relative to the dietetic and manurial values of oilcake. When we are told in a brief sentence, for example, that "linseedcake is both feed and manure," the statement sounds as much like the marvels of quackery, that the mind requires to be "prepossessed," as it were, to comprehend what it means. The man who does so must either be a farmer who has used oilcake successfully in the fattening of his stock, and in the enrichment of his land or dunghill, or else he must be thoroughly conversant by hearsay or otherwise with the facts of the case; for to the purely scientific observer, enshrouded in the mysteries of the modern cheese system of fattening cattle, who reads the statement in its literal light, it most appear manifest that if the whole of the nitrogenous elements of oilcake is converted into flesh, such flesh-forming elements cannot by the same identical process of conversion be made into manure? In other words, what the farmer sends to the shambles is not the identical thing he sends to the land? Or the problem may be placed in a still more ridiculously anomalous light. Thus: *The manure of our cattle is not what we ourselves eat!* Much less is the flesh of our cattle the food which our crops consume? and yet its literal pondering is either the one or the other of these two absurdities! or, what is tenfold worse, both! at one and the self-same time?

How, then, are we to unriddle this oilcake anomaly? How does its use increase the carcass weight of our cattle, and yet at the same time add so much as it obviously does to the value of the manure? If all the nitrogenous elements of the cake go to the dunghill to enrich the manure, then none of them can be assimilated so as to form flesh. Is such really the fact? According to the analysis of our agricultural chemists, the nitrogenous or "flesh-forming principles" of linseedcake may be stated in even numbers at about thirty per cent., and the oil, mucilage, gum, &c., or the respiratory and fat-forming principles, at forty per cent. Now, if the former go to the dunghill to make rich manure, then the increase of carcass weight must be derived from the latter, so far as the cake furnishes feeding material. Is this borne out by the testimony of practice? In short, what is the purpose which oilcake serves in the dietetic economy of our cattle? Linseed may be included in the question.

Medicinal writers and physiologists, so far as we have been able to ascertain, have not investigated the medicinal and dietetic properties of linseed, so as to furnish a satisfactory answer to this important practical question, while chemists do not by their analytical researches add much to the information sought. They, for example, have confined their researches chiefly to the mucilage and the oil, and the medicinal properties of these. Thus, Thomson, in his "London Dispensatory," says: "The mucus of linseed is colourless, insipid, inodorous, and resembles in its viscosity mucilage of senecio gum, but differs from it in the following particulars: Alcohol precipitates it in white floccs, but the liquid remains clear; acetate of lead throws down a dense precipitate; but persulphate of iron and silicated potassa produce no sensible effect. Nitric acid converts it into mucic acid. Guérin found linseed mucilage to contain both a soluble and an insoluble principle; the former resembles pure gum, the latter differing from both cerasin and bassorin." With regard to its medicinal properties, the same authority says: "Linseed is emollient and demulcent. The mucus obtained by infusion is a cheap and very useful demulcent in catarrh, pneumonia, diarrhoea, dysentery, visceral inflammations, calculus, gonorrhoea, ardor urinae, and during the exhibition of bichloride of mercury." "Linseed oil is emollient, demulcent, and slightly laxative." All the other authorities which we

have examined furnish similar testimony. The following is L. Meyer's analysis of linseed, taken from "Perrin's Medical Medica":—

Fat oil	16.285
Wax	0.146
Acrid soft resin	2.498
Resinous colouring matter	0.599
Yellow extractive with tannin and salts (nitric acid the chlorides of potassium and calcium)	1.917
Sweet extractive, with malic acid and some salts	10.884
Gum in the nucleus	6.154
Nitrogenous mucilage, with acetic acid and salts (in the husk principally)	15.120
Starch and salts in the husk	1.490
Albumen in the nucleus	2.784
Gluten in the nucleus	2.931
Husk and emulsions (?)	44.308

"The ashes contained oxide of copper."

We need hardly inform our chemical readers that although this is an important step in the analytical investigation of linseed, it leaves much to be done in the laboratory before a satisfactory conclusion can be drawn as to its proximate principles, or those of oil-cake that is manufactured from it, or the part it serves in the dietary of our cattle.

Linseed mucilage, we are told by the same authority (Perrin) has been examined by Bostock, Vauquelin, and Guérin-Vary. We quote the following:—

Proximate Analysis.		Ultimate Analysis.	
Soluble part	52.70	Carbon	84.30
Insoluble	29.89	Hydrogen	5.69
Ashes	7.11	Nitrogen	7.37
Water	10.30	Oxygen	52.74
100.00		100.00	

The purity of the mucilage above is liable to be called in question, so that the validity of the analyses must be left open for further research.

The following is Dr. Voelcker's analyses of two equally good kinds of linseed-cake, the one English and the other American, extracted from his "Four Lectures," &c. &c. 1—

		English American	
		Cake.	Cake.
Water	13.20	11.64	
Oil	10.30	10.48	
Woody fibre	12.90	14.28	
Albuminous compounds (flesh-forming substances)	29.75	24.01	
Mucilage, gum, &c. (respiratory compounds)	28.38	24.44	
Ash	5.62	5.22	
100.00		100.00	

But, until we know what the proximate principles of oil-cake are, and of all similarly complex substances analysed on the grouping system, the above classification cannot be received as satisfactory. Indeed, it is, on the contrary, highly delusory, and therefore objectionable; for the flesh-forming, fat-forming, and respiratory principles may be so associated, or in combination with unknown principles, poisonous or cathartic, or diuretic, &c., as to render them partially, and perhaps wholly, unavailable. And something of this kind we apprehend, is actually the case with oil-cake itself, its peculiar

medicinal properties being such as satisfactorily to account for all the anomalies previously mentioned, relative to its dietetic and manurial values.

It will thus be necessary to examine somewhat more closely the medicinal properties of oil-cake, in order to ascertain something more of its peculiar dietetic and manurial economy. Generally speaking, the purpose it serves as an article of food for cattle, is chiefly condimental—one which, we may observe, accords with the experience of those who have used it extensively in feeding—for the more thoroughly it is mixed and incorporated with the other feeding materials, so as to season them, the more favourable is the result produced. We have had some animals, for example, both sheep and oxen, that would not even taste it until thus mixed. It is not a natural condiment, as will thus be seen; for all cattle require a little coaxing to get them to eat it at first; so that, although they may afterwards become partially fond of it, the habit is an acquired one, and, like acquired habits generally, stronger perhaps than the natural. Our domesticated animals may be taught to eat and even relish many things which they would spurn and trample under foot were they in a natural or wild state, and at freedom to choose for themselves according to their respective instincts, or when guided by their own chemical senses (smell and taste)—what may not inaptly be termed the natural chemistry of cattle, for there are many reasons to warrant the conclusion that what agrees with the chemical fancies of the nose and palate harmonises with those throughout the whole length of the alimentary canal. Thus, there is manifested in all Nature's works an instructive utilitarian design, every part harmonising with the others; and we have no reason to presume that in the selection of their food our domesticated animals are to be treated as an exception, for acquired habits and unnatural food are never equal in dietetic value to the natural, either as to health or the quality of the milk or flesh they yield for our tables. And this is just what is experienced of oil-cake, the milk, beef, and mutton produced from it being of an inferior quality—much more so in the case of some animals than in that of others, just as it agrees with them. But of this latter more hereafter.

As to the organs upon which oilcake exercises a specific action, it has already been shown that it is both aperient and diuretic. The reason why linseedmeal is recommended and successfully used, for example, in nephritic pains, stranguries, and other maladies of the renal organs, is because the mucilage, in passing off with the urine, sheathes, as it were, by its demulcent action, the passages from the burning irritation of the latter (the urine), the former neutralising to a certain extent the latter, thereby affording the patient relief. Again, as to its laxative action, with such every farmer who has given oilcake or linseed to his cattle must be perfectly familiar. They must also be cognisant of the fact that a much greater laxative effect is produced upon some animals than upon others. Now, in both these cases we see exemplified a two-fold medicinal action—a diuretic and a demulcent, and a laxative and a demulcent; while we further know from experience, that the urine and the dung are both rich in fertilising elements to the land, and what goes to the land cannot go to the shambles.

We thus see sufficient data to account practically for oilcake making rich manure, or at least the *modus operandi* by which such a manurial result is effected. And here we beg specially to remind the reader that this is all we aim at in this paper, viz., to ascertain merely the way by which the problem is to be solved; for until the proximate principles are isolated in a more satisfactory manner, and so concentrated as to determine their specific medicinal action, such, in point of fact, is all that can be done. As Dr. Lindley justly observes in his "Vegetable Kingdom," the seeds of all the flaxworts, linseed not excepted, have common characteristics, and the above—diuretic, laxative, and demulcent—are acknowledged by long experience to belong to the family, both in medical and veterinary science.

But these are not the whole of the peculiar medicinal properties of linseed and oilcake to which we have to direct our reader's attention. The farmer, for example, who has used either of these feeding stuffs successfully, must be perfectly aware, from daily observation, that when his fattening cattle (oxen or sheep) take to thriving on cake, it exercises a specific action on the skin, the nervous system, or temper, and on the organs of respiration and circulation; that animals

differing constitutionally are very differently affected in these several respects: that some beasts will stand a great deal of cake, rapidly increasing in carcass weight, especially when the process assumes the fatty obese form, as it very frequently does; that others who receive and perhaps consume an equally liberal supply daily, can hardly be kept free from inflammatory attacks, while in others some soon become "stalled on cake," and never do well on more than a very moderate allowance. Now, although we do not approve of the obese oilcake system of fattening, we have pursued it successfully for years, forcing the process to the extreme, having oftener than once been obliged to slaughter to prevent some animals from being smothered, as it were, in their own fat, before the day of exhibition, and others from being carried off by inflammatory and other attacks. We have examined the carcasses of animals thus slaughtered, and also the carcasses of the companions of prize stock exhibited at the summer meetings of the Royal Agricultural Society of England, as also the carcasses of prize stock shown at the Christmas fat stock exhibitions of the Smithfield Club, in order to find out the way to a satisfactory solution of our problem, and we shall only farther add under this paragraph, that the field is one of those very broad ones, which, at the present time, loudly calls for experimental investigation at the homestead as well as for scientific inquiry in the laboratory, &c., &c.

It is in vain we search the increase that has taken place in the weight of the carcasses of such animals for the flesh-forming principles of our cake and corn that has been consumed in the obese process of fattening. And this is often not the most vexing part of the practical but anomalous problem, for the daily waste upon the nervous, muscular, and gelatinous tissues must have exceeded the normal standard, if all the other flesh-forming materials of the food consumed have been used up in the flesh-forming and other reparative processes. Now it may safely be admitted as established data, in the generality of these cases, that the reverse of this is true—viz., that there is rather a reduction than an increase in the daily waste of tissue, so that the cathartic action of the cake must have removed to the dunghill other flesh-forming materials than those of the cake itself. But so far as our argument is concerned, it signifies nothing, comparatively speaking, whether the waste is greater or less; for if the former, then the nitrogenous elements are carried to the dunghill by the diuretic action of the cake, and, if the latter, by its cathartic action, as previously stated. In short, the formation of fat under the obese system of fattening is diametrically opposed to the formation of flesh.

This conclusion is evidently unfavourable to cake as an economical flesh-forming material of food for cattle, while its fat-forming function is equally a problematical question. This arises, in all probability, from the peculiar nature of its oil and mucilage, or rather, perhaps, from the medicinal properties of the acrid resinoids and other noxious substances with which they are inseparably associated—such as the oxide of copper found by L. Meyer in the ashes—substances requiring further chemical research, as already stated, before anything definite and satisfactory can be said about them as to the specific functions they perform. One thing, however, is manifest, viz., that they enter the arterial circulation and destroy the normal equilibrium of the alimentary functions, by lowering combustion in the capillaries, and hence the consumption of fuel in the process of calorification; by reducing the juice of the flesh-forming and tissue-forming processes to a minimum; but by greatly stimulating the adipose functions and the deposition of an extra quantity of an inferior and often isolated patchy fat, much of which is only fit for the tallow-chandler. We thus see the source from whence this fatty increase of carcass weight may be derived, so as to solve the fat-forming anomaly; for although the greater portion of the cathartic oil and diuretic mucilage may go to the land or the dunghill via the anus or kidneys, the remainder, by entering the circulation and reducing the consumption of the fat-forming material in the process of calorification derived from the other feeding materials, leaves a much greater general balance for the adipose tissues and its contents under this obese system, than under the natural system when all the alimentary organs, including the whole nervous system, are in lively operation together. Thus we further see how the complaints of the cattle-dealer and drover, that oilcake-fed cattle under this obese system are deficient of muscular stamina on the road to carry

them on their own feet to distant markets; how 'the complaint of the butcher and general public, that the carcasses of such animals are deficient of a fair proportion of lean meat; and how the complaints of the tanner, currier, and shoemaker, that the hides of such cattle, when deprived of the extra quantity of fatty matter with which they are loaded, are of an open, porous texture, being deficient of gelatinous tissue; how, we repeat, such complaints are neither groundless as to fact nor without a physiological cause sufficient to account satisfactorily for their existence. In every branch of science, farming not excepted, effects produced are traceable to their respective causes. Nothing happens by "chance," "good luck," or any other of the mystical *rationale* of the old school; and just so is it with the fat-producing and rich ma-

nure producing effects of oilcake in the obese system of fattening cattle.

These observations are made in reference to the forcing or obese system of fattening cattle only for the shambles. The effects produced by oilcake when given to milch cows, especially if it has been given along with steamed or cooked food, is somewhat different; because in such a case there is a different function in operation, viz. the secretion of milk, by which more of the oilcake, with its noxious elements, may be utilized and removed so long as the flow of milk is kept up, consequently the nervous system and circulation may be less affected; but some cows, when fed liberally with oilcake, are apt to go dry and run to fat, let the farmer do his best to promote the contrary. W. B.

THE BATH AND WEST OF ENGLAND SOCIETY AND THE DEVONS.

At the recent Woodbury ploughing match, Captain DAVY acknowledged the compliment paid to the Royal and West of England Agricultural Societies. He had attended one of the first, if not the first meeting of the Woodbury Society; and he had generally put in an appearance during subsequent years. The Bath and West of England Society had undoubtedly been the means of doing a deal of good in the West of England, inasmuch as, by always holding their meetings in the west, they had afforded the farmers considerable opportunities of seeing for themselves the new and improved machinery which had lately been introduced for agricultural purposes, and thereby enabling them to judge for themselves what was best suited to their requirements. It had also been the means of introducing a better class of machine-makers into this and the adjoining counties. Formerly, if any of their new implements got damaged, they had to send them two hundred miles, perhaps, to get them repaired; but now their blacksmiths and wheelwrights were much sharper, and were quite capable of doing this work. They knew, as a rule, that those countries were most blessed where the energies of the population were most taxed; and this was fully borne out in the case of North Devon, and other parts of the United Kingdom, when compared with the southern countries of Europe. (Hear, hear). He remembered when, at the meeting of the Royal Agricultural Society at Exeter (1850), he purchased an iron plough, and took it home to North Devon, he was asked what he was going to do with it? He replied that he hoped to use it; and he was told that "the horses would 'nt be able to drag en about" (laughter). But, when it came to be tested, it was found that, from being constructed on improved principles, the iron plough worked much easier than the old wooden one. (Hear, hear). Sir Lawrence Palk had alluded to the castigation which he expected to receive from him (Captain Davy) on the question of the breed of cattle; but he assured the hon. gentleman that he need not be at all afraid, for he had neither the power nor the wish to inflict any such castigation. Now, they were told that, at the recent Bath and West of England Meeting, at Exeter, where the Devons should have come out in great force, they, on the contrary, made a very poor show. This was undoubtedly the case; and the like would probably happen if the Bath and West of England Society were to hold another meeting there to-morrow. But let the Royal Agricultural Society of England come to Exeter, Plymouth, or any other town in the county, and he thought they would have no reason to complain of the position which the North Devon men would take in the showyard. He appealed to them as farmers whether, if they had sent anything for competition, they would like to have it submitted to two or three men, as judges, who were totally unacquainted with the things exhibited, and whether it would not give them greater confidence to know that their exhibitions would be judged by practical men. (Hear, hear). The Bath and West of England Society did not appoint qualified judges, nor had they done so for several years past, and that was the reason why the North Devon breeders had declined to send in their stock. Let them look at the meeting at Wells the year before last. There, again, they would find that very few Devons were exhibited by the Devonshire men. The Royal Agricultural Society held its meeting at Batterssea,

only about a month later, and he believed there were twenty-four prizes and two gold medals offered for competition. But where were the prize animals of the Bath and West of England Society then? He believed most of them were in the yard, but they were nowhere in the prize list. The Devon men carried twenty-one out of the twenty-four prizes, and both the gold medals (cheers). Now, how was this? The answer was an easy one. The Royal Agricultural Society appointed three men well acquainted with breeding to be their judges. The society did not choose men from North Devon, or any other part of the shire: they went to Norfolk for one, to Dorset for another, and to Warwick for the third (Hear, hear); and surely there could not be any favoritism in that. Totally unacquainted, but each one an eminent breeder of Devon cattle, they came together, and gave the decisions which he had described to them (cheers). There were eight first prizes out of the twenty-four, and the Devon men took seven of them; and the animal which took the other first prize was more than half a Devon (cheers). No doubt they had all read Mr. Acland's speech at the annual dinner of the Bath and West of England Society, after the Exeter meeting, where he declared, in a tone of triumph, that the Devon breed were going down. He said: "When this society was first established, the Devons exhibited greatly outnumbered the shorthorns, but now the shorthorns are the more numerous; ergo the Devon breed were going down." But he (Captain Davy) told them that it was no such thing. Then, again, Mr. Acland exclaimed, "What do these Devon men want? Have we not gone into their own district, and selected their great breeder, Mr. James Quartly, as a judge?" But there Mr. Acland stopped. He did not say that only two judges were appointed for Devons, and that the second gentleman was a great shorthorn breeder, who would undoubtedly neutralize Mr. James Quartly. If Mr. Acland had stated that a shorthorn breeder had been one of the two judges, the public would then have been enabled to form their own opinion; but he did not do that. Only let the Royal Society come into their county, and he had no misgivings as to the place the Devons would take in the showyard. A man might be a thoroughly good judge of a fat animal, and yet be totally ignorant as to the points which a bull should possess to produce that animal, or one that would fatten quickly. (Hear, hear). And now one word with Sir Lawrence Palk. The hon. gentleman had told them that, to produce a good shorthorn, a good deal of care and nursing were required. But where were all the Devons bred? Why, the whole of the farms, on which the best animals were produced, were 1,400 feet above the level of the sea, and where they had eight months' winter to four months' summer. What nursing did they think their animals got? and what would they do with shorthorns down in his country? They couldn't wrap them up in flannel, as that was getting rather an expensive article since the American war (laughter). He did not believe animals had any magical power to make beef, except from the food which they consumed. A certain amount of food created a certain amount of beef; and he believed, if they took a shorthorn and a Devon, they would find that the latter carried a larger amount of ninepenny beef than the shorthorn. (Hear, hear.)

CONVERTING STRAW INTO MANURE.

The following lecture was delivered at the Boroughbridge Agricultural Association by Mr. WM. HARLAND, of Blows Hall, Yorkshire:—

Gentlemen,—When I accepted the invitation to introduce this important subject, it was not with the idea of being able to render information, but with the hope of eliciting, from persons of greater experience than myself, such remarks as may prove advantageous to each of us. I imagine the title of this subject to imply two questions, namely—What description of stock must be employed on our respective farms to convert the straw into good manure, and, at the same time, leave the best return for the food consumed and the capital employed? Secondly—What arrangements must be made so as to ensure the good quality of the manure, and to preserve it from waste during preparation? I am indebted to several chemists and other practical men for many of the remarks which I have ventured to introduce, believing that by so doing I should render greater justice to the subject than by any other means: for I believe that we persevere with greater energy in our present course, or enter on a fresh experiment with greater confidence, when we find our ideas backed by the researches of men of science. As straw is the raw material of which we wish to dispose to the greatest advantage, it may be as well to consider what portion thereof should be used as food, and what portion be disposed of as litter. By some it is urged that, whatever cereal is most suitable to a soil, there the straw of that cereal will be most valuable as food; by others, that cattle are themselves the best judges, and that, therefore, that straw which the stock seem to relish most should be retained exclusively for food, and the remainder condemned for litter. Pea haulm, when well harvested, is undoubtedly more nutritious than any other straw, and should therefore be used as food, and is very valuable for ewes at the lambing season. Bean straw is decidedly inferior to any other kind of straw, except the pods, on which animals do well if allowed to pick them off; and yet a great difference of opinion exists, some persons considering that bean stalks are almost equal to clover hay; and others think them only fit for litter. There is a great difference of opinion of the feeding value of wheat, barley, or oat straw; and, perhaps, no very broad or permanent distinction exists. Dr. Voelcker tells us that the composition of straw is materially influenced by the degree of maturity in which the corn is harvested—as, for instance, it has been proved by analysis of oat straw (which is generally next in value to pea haulm) that, of sugar, gum, and other matters in food, not less than 16 per cent. occurs in green straw, as against 8 per cent. in over-ripe straw, and 10½ per cent. in the fairly ripe sample. It is interesting to learn that, hard and dry as straw appears to be, it contains, among other nutritious matters, an appreciable quantity of a nice yellow sweet-tasting oil. In a sample of well-harvested wheat straw, neither under nor over ripe, there was at the rate of 39 lbs. of oil in a ton of straw. The same remark applies to barley straw, which is more suitable for young stock, as it does not contain so much woody fibre, and is consequently easier of digestion. I may here remark that barley-chaff, when scalded with boiling linseed, is much relished by horses; and I am quite satisfied that the whole of this article should be *thus* used for food. Dr. Voelcker proceeds to remark: "Many farmers form much too low an estimate of the feeding value of every kind of straw, except pea-haulm." On the other hand, the views of others respecting the nutriment contained in straw are so unmistakably exaggerated that, with some degree of justice, they are made a laughing stock at the market table. The main anxiety of the first-named class seems to be, how to tread into manure all the straw grown on the farm; that of the second, how to stuff stock with all the straw at their disposal: the creed of the former being, that neither little nor much will do their cattle any good, whilst the latter held that any appropriation of it for litter is an intolerable waste. The

sober-minded, observant, and intelligent agriculturist, however, knows full well that, whilst wheat, oat, and barley straw, when cut into chaff, possess a certain feeding value, particularly when this bulky material is combined with some concentrated or more readily digestible food, they are not the less essential, on the majority of farms, to the production of good farmyard manure. The fertilizing value of straw is very insignificant. Its merits are as an absorbent of the most valuable portions of the excrements of animals, and as the best fixer of the ammonia which is always generated when excrementitious matters, in contact with porous materials, enter into active fermentation. As an article of food, straw is worth from 80s. to 40s. per ton, when associated with food containing flesh-forming matters; but, when used alone, its value becomes very small, as it does not contain all the material necessary to support the animal in a thriving state. The quality of farmyard manure takes a wide range, according to the system adopted, and its quality is easily regulated thereby; whilst its extreme value places it in a pre-eminent position as the most valuable of all manures. We experience its value in the increase of crops, and the gradual improvement in staple of the soil. It is perhaps impossible—so variable are the conditions on which its quality depends—to state precisely the value of farmyard manure; yet it is certain that a man must not expect the same increase of crops from washed and decayed straw as his neighbour, whose manure is made under cover, and contains the essence of cake and corn. In the fifth volume of the Bath and West of England Society's Journal is recorded an analysis of two samples of good farmyard manure, containing a general admixture of the excrements of horses, cattle, and pigs, such as would be produced on a well-managed farm, carrying out a mixed system of husbandry, but in different conditions, showing the value to exceed our general ideas of such manure:—

	Fresh manure.		Well rotten.	
	s.	d.	s.	d.
Value of insoluble matter	7	11	5	3
Value of soluble matter	5	8½	7	8½
Total value of a ton of manure..	13	7½	12	6½

It must be borne in mind that this manure had been carefully preserved, and consequently not injured by the loss of its valuable portions. Dr. Playfair has compared the body of an animal to a furnace—the food is fuel, the excrements are the ashes, and the gases expired from the mouth are of the same composition as those which fly up the chimney of the furnace. If the food or fuel supplied to an animal be abundant and of rich quality, the manure produced is valuable; but if the food is indifferent, too watery, as white turnips, or too woody, as straw, or if supplied scantily or insufficiently, the manure is almost valueless, and all the turning and heaping up possible will not render that valuable which was before almost worthless. The manure of a full-grown animal cannot be so much exhausted as that from young growing animals, to which bone and muscle have to be supplied, neither can the manure of working cattle or milch cows be equal to that of fattening animals, even when kept on the same food. This leads us to the conclusion that fattening animals are producers of the best manure; for, to make an animal fat for the butcher, at a profit, it must be done as quickly as possible; and in order to accomplish that object, it must be amply supplied with rich, flesh-forming food; and as an animal when almost fat only extracts from the food a small proportion of the nitrogenous matters contained, it follows that the remainder will be ejected from the system; so that the nearer maturity an animal is, the richer will be the manure. This confirms the opinion of those who, along with myself, urge that the system of sending animals to the butcher when only half-fat is bad. The problem which the feeder has to solve is, how to supply his cattle with such food and in such quan.

titles as to ensure the largest amount of increase with the smallest possible loss; and for this purpose it is necessary not merely to select the largest quantity of nutritive matters, but to attend to the proportion in which they are mixed, and to restrain, as far as possible, all those functions which are productive of waste. For the solution of these questions, the nature of the food, the condition on which its nutritive qualities depend, and its special suitability to particular purposes, must be considered. We must now consider what food can be used which will profitably associate with or take the place of roots in conjunction with straw, in the maintenance of our flocks and herds during the winter—bearing in mind that fodder, when insufficient for its duty, is a very expensive food, for the material of the animal has to make up the deficiency, which is a costly substitute. According to a table in the fourth volume of the Bath and West of England's Society's Journal, the value of different articles of cattle food are placed thus:

Number of pounds weight of each required to make one pound of beef.

Barley	6	Linseed Cake & Peas } 4½	
Oats	7	equal quantities .. }	
Beans	8	Clover Hay	12
Peas	8	Swedes	150
Rape Cake	6	Mangold	150
Cotton Cake	6	Carrots	150
Linseed Cake	5 or 6		

Having introduced this table, I think it will be well to leave it to those who have the stock to determine which of these articles of food can be most profitably employed, as the relative price of each requires consideration. There is, however, no doubt that it is more profitable to associate roots, cake, and corn, together in the feeding of cattle, than to endeavour to feed an animal with an abundance of roots alone; and, as in the experiment of linseed cake and peas, the most profitable results occur, according to the foregoing table; so I believe the case to be generally, where food of different tendencies is amalgamated, as is the case here, the oilcake being a relative food, while the peas have an opposite tendency. I have been told that the best way to make good manure is to give a large quantity of oilcake. Admitted that this manure would be rich, but may it not thus be bought too dear? for as an animal can only assimilate a certain proportion of the nitrogenous matters contained in food, so it follows that what is not needed in the system will be ejected; so that if an excessive quantity be given, it can only be with the certainty of finding it, in due course, in the manure heap. Professor Voelcker is of opinion that we are not far wrong in saying that we may fairly expect three-fourths of the nitrogenous matter of oilcake back again in the manure; and perhaps we are safe in asserting that one half of the money-value of rape and best cotton cake is obtained back in the manure; and Professor Anderson remarks that a series of experiments appeared to show that of food generally about one-third or one-fourth of the money-value, and seven-eighths of the valuable matter appears in the dung. Thus we arrive at the conclusion that to obtain a good manure our stock must be amply supplied with good food. The system of feeding cattle advocated by Mr. Blundell, of Bursledon, was considered by him to be profitable, therefore I have ventured to introduce it. Thirty-seven bullocks averaged as follows:

Dr. weekly.		s.	d.
To 28lbs. of oilcake, £12 per ton		3	0
7lbs. of bean-meal, £12 per ton		0	9
44lbs. of mangolds, 10s. per ton		2	0
140lbs. of oat straw, 30s. per ton		1	10
140lbs. of straw litter, 15s. per ton		0	11
To attendance per week		0	6
To interest on capital and gain		3	0
		12 0	
Cr.			
By increased value of bullocks per week, for 20 weeks ..	10	8	
By value of manure	1	4	
	12 0		

On many farms the feeding of cattle for the butcher cannot be extensively and at the same time profitably carried out,

as, for instance, the farm on which I live requires, as nearly as possible, all the roots to be eaten on the land by sheep, or the deficiency to be made up by other means. Again, there is the strong-land farm, where roots are not extensively grown. On such farms the question arises, by what kind of stock can manure be profitably made without feeding cattle? The manure of fattening pigs, plentifully supplied with meal, most especially that of beans or peas, is considered superior to all others; but it is to cattle, horses, or sheep that we must look for the conversion of large quantities of straw into manure. If a few turnips can be spared by giving them carefully and in small quantities at a time, with the barley or other sweet straw, three or four times the number of young stock may be wintered in a healthy growing state than might be fed and made fit for the butcher on the same food. The addition of a little linseed cake, or other artificial food, is advantageous, not alone in the manure, but in the increased value of the animal during the ensuing summer, over those cattle which have been wintered without artificial food—as there is no doubt that cattle which have been kept from youth in the best possible condition, and in short never allowed to lose their calf flesh, and so brought out to the butcher at an early age, will have cost much less per pound than the four or five years old ox, which has been thinking one half of his life of the food he ate the other half. There are but few farms where a few roots may not be grown—on such, however, the difficulty becomes greater—and there is no alternative but to use a greater quantity of artificial food, either in the shape of boiled linseed thrown over the cut straw or in the shape of cake or meal. When tares or clover are grown a large quantity of manure may be made by keeping the working horses in the yards during the summer; but as the droppings of horses alone are hardly moist enough to make good manure, a few swine may be advantageously employed the same as in winter—when it is advisable to rear young pigs in the yard which receives the stable dung—the pigs move about among the litter and deposit their saponaceous excrement, which prevents the heating or fire-fanging of stable dung. The manure of horses is more forcing and liable to heat than that of cattle, and should either be mixed with the droppings of other animals or moistened with water, to which a little sulphuric acid has been added, to fix the ammonia, especially when exposed to the air in dry weather—else much ammonia is lost, and the weight much diminished. If made under cover the loss will not occur, since it will be protected from solar heat—for this purpose covered yards are especially valuable. The Spaniard has a proverb that the sheep treads on the land with a golden hoof. Will it not be well, therefore, to inquire whether the same remark may not apply to sheep treading on the straw which we wish to turn into manure. It is the custom in some parts of Hampshire, on heavy land, to spread the wheat straw (from the thrashing machine) on the land, fold sheep on it, and then plough it in. Perhaps the nature of the soil warrants the mode; but I should prefer the system described by Mr. Ruston, of Aylesby House, Chatteris, at the Central Farmers' Club, April, 1861, and whose remarks are corroborated by other farmers of strong land. Mr. Ruston had for five years tried sheep in the yards, and at that time had between 600 and 700 sheep and lambs in his ordinary fold yards—being allowed as many mangold as their bodies would bear, to which is added cake or corn, along with a sufficient supply of dry food in the shape of chaff, hay and straw about four yards square being allowed for each sheep, the yards being properly drained and littered every day with a slight covering of straw, and twice a day in showery wet weather; thus, if the sheep be free from lameness when placed in the yards, and the littering carefully attended to, there need not be much fear of foot rot: their feet should be pared at least every three weeks. Mr. Ruston considers that six lambs will tread down as much straw as a £12 or £14 bullock, and calculates that instead of one hundred bullocks leaving £150, after paying for the artificial food, 600 lambs did leave £390 for the same quantity of food, the sheep thus leaving a profit of £240 in excess of the bullocks. The manure may be made in folds in any field by means of hurdles, and thus the carting of the manure be saved. In answer to my inquiry, Mr. Ruston informs me that his opinion on the yarding of sheep is unchanged. He adds, as the result of

past experience: "I have come to the conclusion that on my farm lambs pay better for yarding and consuming mangold than sheep, and that either pays better than bullocks." Previously to the lambs being placed in yards, they should have been on rape, so as to strengthen them and render them better able to bear the relaxing properties of the mangolds. Mr. Bood, of Ipswich, in a paper on the stock farming of retentive soils, remarks that his ewes are placed in roomy yards when the weather becomes wet and cold, and supplied with cut straw in troughs, and fresh straw in racks. They were turned into a pasture for a few hours each day, and have there a few swedes or mangolds. Four or five weeks before lambing a little rape cake is added to the chaff, and I think that this addition might be profitable during the winter. Mr. Kemp, of Berkshire, recommended that the yard be laid over with faggots, to allow the water to drain away. Respecting the quality of sheep manure, Mr. Lawes, in answer to Mr. Ruston's inquiry, replied: "I have no reason to suppose that the manure from sheep or bullocks, eating equal quantities and qualities of food, would differ in value; and you will be quite justified in assuming that the quality of the manure depends upon the food consumed, irrespective of the animal." We learn from another source that sheep manure, when kept in a heap, decomposes rapidly, and should not be spread in large quantities on light land for cereals, as it is very quick in its action, and causes them to run too much to straw. The urine of sheep is a valuable fertilizer. The wintering of cattle profitably involves many serious considerations. Next to food is the accommodation available in the shape of buildings, comfort, and warmth, being equivalents of a large quantity of food, and convenience of arrangement being a great saving of labour in attendance; and on such considerations depend the profit of the affair. Sheep seem by nature to be so clothed that they should not need shelter so much as cattle, and yet we learn from a series of recorded experiments that it requires 150 lbs. of swede turnips to produce one pound of increased weight, the animal is exposed to all weathers; while 100 lbs. with shelter gave the same results. The manure is likewise impaired by want of shelter, for as the animal is a species of furnace in which food is consumed, it follows that the more rapidly that the animal heat is carried off, the greater the consumption of heat-producing food to maintain it, and thus the ashes must necessarily be deprived of material valuable as manure. When other yards are used, the floor should be paved or otherwise rendered impervious to wet, the soil having been previously excavated to the depth of four or five feet, and drains so arranged as to carry off superfluous moisture into a tank; the sheds should be wide and, along with all the other buildings, should be spouted, that no water, except that which falls on the exposed surface of the manure, be allowed to enter the yards. I think the best style of building for feeding in is the loose box or covered homestead, which may be arranged in yards, or in a series of loose boxes (as described by Mr. Hayes, at the Pembroke Farmers' Club), twelve feet or so square for a pair of oxen loose, or a larger number of smaller ones; the floor is sunk three or four feet below the feeding alley, and is asphalted; twelve inches of soil is placed upon this, the animals are littered with 20 lb. of straw each per day, and this is not removed until the box is full. By this system the comfort of the animal is secured, and the manure will not have received a drop of rain water. The manure thus made must necessarily be superior to that made by stall-fed cattle, which is thrown on a heap at the feeding-house door, or into a court under young stock, where it would be plentifully washed by the rains and weakened thereby. By means of the covered homestead, a great quantity of straw would be available for fodder which would otherwise be needed as litter, and thus a greater number of cattle might be wintered advantageously, and the manure will be at once fit for application to the land. There is a great difference of opinion as to the necessity of throwing manure into a heap before it is applied to the land. I think it is necessary in most cases for the more perfect admixture thereof, and the destruction of any seeds of weeds which may be therein contained. The turning over of manure will not supply fresh constituents; it may diminish the water contained, decay the vegetable fibre, condense and render manure more portable and adapted to the organs of the plants, but

can add nothing which does not already exist. When manure is thrown into a heap it should not be less than 4½ or 6 feet thick, and should be covered with road scrapings or soil, or the ammonia should be fixed by the use of sulphuric acid, gypsum, or sulphate of iron, diluted with water, and sprinkled over the heap. It has been remarked that one can at first sight judge of the industry and degree of intelligence of a farmer by the care which he bestows on his manure heap, which should be so placed that the liquid which escapes should not be allowed to flow into the nearest ditch and be thus wasted. It has been computed that on some farms, where due care is not taken of the liquid drainage from the manure heaps, the loss is equal to three cwt. of Peruvian guano for every 25 loads of manure made on the farm. If the farm is situated in a district with the average rainfall, Professor Tanner remarks: That when the fermentation of a manure heap is proceeding rapidly, an occasional supply of water, or what will be better, liquid manure, should be pumped or thrown upon the heap, not sufficient to cause drainage, but still to soak into the centre of a heap; the sinking of an iron bar into the centre of the heap will aid the passage of the water, and at the same time assure you whether additional moisture is needed or not. It is necessary for the more complete decomposition of the dung to turn it so as to admit air; then be especially guarded, and take care that sufficient moisture is also added at such intervals as may be necessary. Remember that by the admission of air you are stimulating a slow fire, which, if allowed to proceed unchecked by the presence of moisture, will dissipate into the air much valuable fertilizing matter; but if judiciously controlled, you will be able to change the condition of your manure, while at the same time you will secure all its fertilizing matters. The review of the evidence which might be brought to bear on this subject, along with my own observation, leads me to the following conclusions, namely—that in order to convert straw profitably into manure, the food which is supplied to stock should be such as is suited to their wants; that the quality of the manure depends greatly on the quality of food supplied to animals; and thirdly, that the covered homestead best affords comfort, economises food, and prevents injury to the manure by drought, or excessive moisture. It may be well to bear in mind the remark of Mr. Bakewell, of Dishley, which is as true now as it was when uttered: That the road for a farmer to get rich is to breed the best stock of whatever kind, as the best consume no more food than the worst. "Good farming," said that celebrated man, "is to get a dinner for your appetite, while bad farming is only getting an appetite for your dinner."

Mr. CHRISTOPHER CLARK said that the recommendation to frequently turn a manure heap surprised him. Good "muck," as it ought to be, lost much of its value when turned over. Every time a manure heap was disturbed a quantity of ammonia evaporated. Really good manure did not require turning at all. He asked Mr. Harland what quantity of cake daily he considered necessary for a three years old bullock to keep him in a healthy state.

Mr. HARLAND said he gave from five to six pounds per day; but he recommended some other kind of food as well as cake, such as bean or barley meal.

The VICE-CHAIRMAN remarked that Mr. Harland had placed before them a good deal of useful information, and told them many things which he had no doubt they would profit by. He, however, thought that Mr. Harland had scarcely explained the best methods of making straw into manure on particular descriptions of farms. On some holdings it was easy to make straw into manure, but on others it was a difficult task. He considered straw of great value upon a farm, and this he felt to be the case inasmuch as he occupied a large quantity of grass land. Both upon grass and tillage farms straw was valuable, and when it was allowed to get wet, by lying exposed to the rain in the yard, it was simply wasted. As soon as straw was rotten, some people supposed that it was manure; but this was perfectly absurd. From what Mr. Harland had said he understood that he was of opinion that straw of this kind was not manure; it was merely rotted straw, and in this he quite agreed with him.

Mr. HARLAND said that covered yards would enable a farmer to feed a larger number of stock than with open yards. On his farm he had no straw to spare.

The VICE-CHAIRMAN stated that he had discovered, by pulping his turnips, that the beasts did not consume so much straw. For his own part he would never erect a homestead without having it covered in. He had some time since determined to try experiments, in order to find the difference in value between the manure made in a covered homestead, and that produced in an open yard; but he was sorry to state that he had not yet carried his intention into effect.

Mr. T. SCOTT said that he had tried it, and he ascertained that one load made under cover was worth two loads produced in the open air, especially if the season was wet. He thought the question of converting straw into manure might be divided into two heads, namely, farms where a great quantity of straw was grown and a small proportion of root crops; and farms where little straw was produced and a large number of cattle kept. In either case he was of opinion that the pulping of turnips was essential; and covered home stalls he should also recommend, as being decidedly an improvement on the open yard arrangement. With a superabundance of straw it was necessary to use cake freely as food for cattle, in order to have the manure

of good quality. Where the system of pulping was adopted, and a large herd of store cattle kept, rape cake might be used advantageously. Yet he did not believe in the doctrine that a ton of manure made from rape cake was equal to that quantity made from linseed cake, that is if the latter was of good quality. He considered dunghills quite unnecessary, and preferred applying the manure directly from the yard, instead of first carting it into heaps and afterwards spreading it on the land, which last mode not only entailed a loss of about 20 per cent. on the actual value of the manure, but also a decided loss from fermentation. Turning dung was quite out of the question, and was nothing more or less than waste of labour and of property.

The Rev. R. D. OWEN said he had heard it stated that out straw and hay were better for stock than hay alone, and he inquired if such an opinion was correct. If it really were a good plan, the use of cut straw and hay would he thought have a tendency to increase the manure and improve its quality.

The VICE-CHAIRMAN and Mr. SCOTT answered the rev. gentleman's question in the affirmative.

ON THE RECLAIMING OF WASTE LAND.*

By JOHN CLARK, OF KIRKLAND PARK, STRATHAVEN.

[Premium—The Gold Medal.]

The reporter does not know the precise elevation of the lands improved, but believes it to be, when lowest, a little over 400 feet, and, when highest, perhaps 550 feet above the level of the sea. The lands are situated about fourteen miles south-west of Glasgow, about ten miles from the nearest point of the Firth of Clyde. They are mostly in Ayrshire, but partly in Renfrewshire. They consist of two conterminous farms, and extend in all to 335 acres, or thereby. More than half the extent reported upon was, strictly speaking, waste land. It consisted of "spritty" marshes interspersed with "bent" and moss, and dotted here and there with patches of dry land resting on whin rock. The yearly value of one-half of it might vary from 5s. to 10s. per acre prior to improvement. Such lands, intersecting and interlacing more or less the whole extent, rendered the naturally dry land comparatively unavailable for any purpose of agriculture. The farms comprised a considerable extent of superior meadow and some productive "croft" land, which raised the rental of the whole prior to improvement to an average of about 16s. per acre. The subsoil of the swamps is generally clay at a depth of from two to four feet. Veins of sand generally traverse the clays at various depths. Instead of clay subsoil sometimes there is sand, gravel, or marl, and this especially at the swamps near the dry spots. A band of "chatter" also not unfrequently succeeds the clay, or immediately underlies the saturated upper soil. Whin rock and flat stones at every depth and in unlooked-for positions were the great difficulties the reporter had to contend with in drainage. He found the obstructions from these causes especially formidable and irksome in the formation of the mains and outfalls, and is inclined to ascribe to them in no small degree the almost total absence of efficient drainage till very lately in his neighbourhood. In his drainage, except at the very first, he used the pipe-tile almost exclusively. The reporter began his improvements in the autumn of 1847, and in order to give a clear view of his mode of operation and its results, he would take up the different fields and portions of the farms separately, namely:—

No. 1.—This field, extending to 13½ acres, was of the average quality of the farms, or about 16s. per acre. It was drained generally about 3 feet deep by 15 to 18 feet apart. The material used was partly tile and sole, partly pipe-tile. This field was a very expensive one to drain, partly on account of the quantity of whin rock, partly on account of the system pursued. The drains are much too shallow and much too

close together. Though telling well at present, the reporter does not doubt that many of the drains will ultimately require deepening. The drainage of this field, as given in to the Inclosure Commissioners for England and Wales, cost £9 5s. 7d. per acre. After drainage a crop of sandy oats was taken. The crop was excellent for the part of the country—not measured exactly, but should say not under 50 bushels per acre. 2 cwt. of guano per acre were harrowed in with the seed. Potatoes and turnips followed the oat crop. The turnips were fair, but the potatoes were much diseased. Both potatoes and turnips were limed on the top of drills. Oats similar to the lea crop as to quality and value, with grass seeds, followed the green crop. The hay crop (principally perennial rye-grass and clover, but with a mixture of natural grasses) was generally very heavy. It was sold on field account, and some of the lots were as high as £8 10s. per acre; average from £4 to £5. The faggage was let for sheep at 10s. per acre. After the hay crop pasture followed. The field was let by public roup as a grass park, and produced £29 10s. Next year it was again let at £24. The year following it was again let by public roup as a grass park at £30.

No. 2.—This field was drained at the same time and in the same manner as No. 1. It extends to 6 acres and 7 poles. It was not nearly so difficult to drain as No. 1, and required no trenching. The expense, including fences, approached £50. Prior to drainage, the land was much more valuable than No. 1. If let separately, it might have given 30s. per acre—say £9 for the field. Till last year no opportunity was afforded of testing its new value. It was let in its improved state at Martinmas, 1853, as a grass park, at £15 17s. 6d.

The course of cropping of No. 2 was the same as No. 1, except that barley to some extent took the place of oats after the green crop. The value of the crops of the two fields was very similar.

No. 3.—This field extends to 11 acres, 1 rood, 6 poles. It was drained in spring and summer of 1848 at an expense of £55. To this falls to be added £15 for fencing, &c. The whole expense of improvement amounted as near as possible to £70. The drains in this field were 4 feet deep, and at irregular distances apart, there being a good deal of dry land in it. It was, prior to improvement, one of the best fields in the farm. It might have let as a grass park at 30s. per acre. In spring of 1849 it was broken up, and a crop of oats taken—partly sandy, partly birley oats. Crop looked like 50 bushels per acre, but not measured. The upper end of the field had 3 cwt. of guano per acre harrowed in; the lower end received no dressing of any kind. In 1850 a second crop of

* This report, it ought to be stated, was written in 1855.

oats was taken, and the land sown down with a mixture of perennial white and yellow clovers, and several kinds of natural grasses. About 40 square yards per acre of farmyard manure were put in with the oats over the whole field, and on that portion of it which got no guano in the lea crop, about 20s. worth per acre of bone-dust was added to the farm-manure. The crop was superior to the lea one—indeed it was rather too bulky. It was sold on foot by public roup at prices ranging from £5 to £6 per acre. The hay crop next year, also roused on foot, averaged about £4 per acre. The foggage was afterwards let for sheep-grazing till April at 10s. per acre. It ought to have been stated that, after the removal of the second oat crop, the whole field was limited at the rate of from 4 to 5 tons of shells per acre. In 1852 the field was pastured with a mixed stock; in 1853 it was also so pastured—both years at original rent, on account of existing bargain. In December 1853 the field was let by public roup as a grass park at £22. Last Martinmas it was again roused as a grass park, when the rent rose to £25 15s.

No. 4.—This field extends to 17 acres 2 roods 15 poles. The drainage of it was partly executed in the winter of 1847, spring of 1848, and spring of 1849. In the portion earliest drained, the writer considers the drains as much too shallow and too close together. The depth varies from 3 to 3½ feet; the distance apart is 15 feet. About 7 acres of the field are drained on this system, of which 1 acre or so shows symptoms of damp; the remainder seems dry at present, and is covered with a rich coating of fine grasses. The writer intends despoiling each alternate drain of the above 7 acres to 5 feet prior to further tillage. The portion of the field drained in spring of 1849 is done with 5-feet drains placed 18 feet apart, and in this portion the improvement is perfect. The writer now considers that instead of 18 feet, the drains might have been 30 feet apart, and the effect the same. As it is, the drainage of this field as a whole was not expensive, much naturally dry land being interspersed through the swamps, and the interruptions by whin rock not being frequent or serious. The opening of a very long outfall was the principal disadvantage. Drainage, outfall, fencing, &c., cost, in round numbers, £120. Prior to improvement, two-thirds at least of this field was perfectly useless as far as tillage was concerned. For grazing young cattle the 17½ acres odds might be worth £8 yearly. The drainage of this field being done at different times the cropping was irregular. Two-thirds of it was green-cropped, the remainder sown down with oats, 40 yards of farmyard manure per acre being put in with the seed. The oat and turnip crops were fair as a whole, the potatoes much blighted, the hay excellent on the formerly wet lands; on the naturally dry portions, generally rather a light thin crop. About half this field has been limed; the remaining half is still to lime. In December 1853, this field was let by public roup as a grass park, at £31 10s. Last Martinmas it was again let by public roup as a grass park, and it made £39 5s.

No. 5 and 6.—These two fields (hitherto let together)—extended to 19 acres 1 rood 26 poles. They were drained partly in spring and summer of 1848, part in spring of 1849. They contained considerable portions of tolerably dry land, and being near the farm house, these portions had been repeatedly manured. Taking wet with dry they might be worth from 20s. to 30s. per acre—say 25s. over head. The drainage of these fields seems perfect. Whin rock was frequently annoying, and interfered materially with the depth of the drains; but wherever practicable the drains were about 5 feet deep, the distance apart varying from 18 to 30 feet. About 2 acres of these fields were green-cropped (after being trenched) in 1848. The crop—potatoes—except a small patch of carrot—was, though partially diseased, much above an average. In spring of 1849, the fields were wholly broken up, and one crop of oats taken, about 40 yards of farmyard manure being applied to the greater portion of the extent. When green-cropped the previous year, no top-dressing of any kind was applied, and 3 acres or thereby of swamp got, instead of farmyard manure which ran short, from 2 to 3 cwt. guano per acre. The crop (sandy oats, except the green-cropped land, which was tartar oats) would average 48 bushels per acre, except on the green-cropped land, which produced fully 72 bushels per acre. The fields were wholly sown down with perennial ryegrass, clovers, and a variety of natural grasses. As soon as possible after the removal of the oat crop, the fields were limed at the rate of about 5 tons of shells per acre.

In 1850 the hay crop was excellent; on the green-cropped land especially it was very bulky. It was roused on the foot, and realized rates varying from £3 up to about £5 per acre. After the removal of the hay crop, the foggage was let by public roup from 1st September till 20th April following, at £10 10s. In 1851 and 1852 the fields were grazed with mixed stocks, and were observed to grass very far; but on account of a peculiarity in the arrangement with the old tenant, no opportunity of testing their value occurred till the end of the last-named year. In December 1852, the fields were let by public roup as grass parks, at £38 5s. In December 1853 they were again let by public roup as grass parks, at £39 10s., and last Martinmas they were again let as grass parks, at £43 15s. The drainage, fencing, trenching, and levelling of the two fields cost, in round numbers, £160.

No. 7.—This field extends to 11 acres and 7 poles. It was drained in spring and summer of 1848; drains from 4 to 5 feet deep, and 18 feet apart, except 2 acres, where they are 30 feet apart. The 2 acres were lying in 30 feet ridges, with deep furrows. No difference perceptible as regards dryness between the 30 feet and the 18 feet drainage; both seem perfect; 2 acres of the latter were trenched and planted with potatoes in 1848. The crop, though diseased considerably, produced about £16 per acre. In 1849 the whole field was in oats; it received, except the green-cropped land, about 3 cwt. of guano per acre; the green-cropped land which was sown with tartar oats, produced upward of 72 bushels per acre, but the other portions (partly sandy, partly tartar-oats) were very unequal, and would not average over half as much. The green-cropped land was sown down principally with timothy-grass and perennial ryegrass, and in 1850 the hay was sold by public roup on foot at about £5 per acre; it was an extra crop. In 1850 the rest of the field was in turnip, carrot, and potatoes. The carrot ground (3 roods) was trenched, and the crop above an average. The potatoes (2 acres) were much blighted, and a poor crop. The turnips were irregular, but on the whole a bulky and superior crop. In 1851 the whole field (except the 2 acres green-cropped in 1848) was again put under carrot, potatoes, and turnips. The carrots about 2 acres, the potatoes 1 acre, the turnips the remainder of the field. The carrot land was half trenched. The potatoes, as usual, were much diseased, but the carrots and turnips were excellent. The 2 acres in hay last year were again roused on foot, and produced above £5 per acre. The timothy this year greatly predominated. In 1852 the twice green-cropped land was sown with barley-oats, which were sold on foot on foot by public roup at prices varying from £5 5s. to £6 10s. per acre. The field averaged, it was understood, about 10 bolls per acre, milling "meal for corn." In 1852 the 2 acres of hay-land (now irrigated) were sold in ricks, producing much about the same as in 1851. In 1853 the whole field was in hay, and sold on foot by public roup, realising from £4 to £5 per acre. After the removal of the hay crop, the foggage was let for sheep-grazing up till 1st April, at 10s. per acre. Last year it was again hay, and sold by public roup, partly in ricks, partly on foot; the prices and crop were much the same as in 1853. The foggage was also again let for sheep-wintering; it was a shade dearer. The grass of this field is principally timothy; and as a great portion of it can be irrigated, cutting is intended to be continued. Including foggage, the rate has hitherto been above £5 per acre, and it seems not unreasonable to suppose that something like the same figure may be maintained.

No. 8.—This field extends to 21 acres and 37 poles. It was drained in summer of 1849. Drains from 4 to 5 feet deep and upwards, and generally about 18 feet apart. A good deal of naturally dry lands in the field, but detached and indented with marshes and quagmires. In its unimproved state its value might be about the average of the farms, viz., 16s. per acre. After drainage the field was limed to the extent of about 4 tons of shells to the acre. This field has never been broken up, and till the end of 1852 (owing to the lease) no opportunity was afforded of testing its value. The expense of draining, fencing, and smothering up this field was about £170. In December 1852 it was let by public roup as a grass park at £40 15s. to the old tenant. In December 1853 it was again roused as a grass park, and produced £41 10s.. Last Martinmas it brought £44 5s.

No. 9.—This field contains 13 acres. Except about 3 acres it was "waste land." As far as any purpose of tillage was concerned it was merely a spritty swamp. Including the 3

acres of dry land, the annual value might average 10s. per acre. It is proper to state that, prior to the commencement of the improvements which are the subject of the present report—viz., in 1843 and 1844—the tenant in the lands (the tiles being furnished free by the landlord) made a sort of drainage of this field. The drains were shallow and ineffectual, but they enabled him to plough green crop and lay down the land. Though much improved, it had for the most part from the first the blue, cold appearance inseparable from wet, and, so far as the writer's experience goes, inseparable from shallow draining, especially in boggy land. Therefore, in summer of 1849, the proprietor set about draining the field afresh, paying no attention to the old drains as he proceeded, beyond removing the tiles. The old drains were principally across the hill, and about 30 inches deep. When it could be effected, they avoided the rock by going round it. When that could not be managed, they stopped upon reaching it. The new drains, 4, 5, or 6 feet deep, according to subsoil, were cut right up the acclivity, and never avoided the rock. When blasting or any very arduous picking was necessary, they were cut into the rock, say to the depth of 30 inches to 3 feet, *where shallowest*, and allowed to drop backwards and forwards from the shallowest point—forward into the continuation of the drain—backwards into a cross-drain communicating with one of the up-and-down drains in which rock did not occur. The writer had learned, from experience, that without breaking up the rock freely, and to a sufficient depth, in such springy lands, his draining would be a failure; hence he never attempted (except at the very outset of his improvements) to double round it. At first he did attempt to save in that way, but instead of saving he just, by being obliged to go back on his work, put himself to more expense than was necessary, and this over and above the injury resulting to his crop. The new drains were placed 18 feet apart. All the extra subsoil from the drains was spread on the ground, and the turf neatly replaced over the drain on the surface. After draining the land was limed, say to the extent of 4 tons of shells to the acre. The effect produced by the new drainage was in 1850 most perceptible, and in 1851 and 1852 the field had exchanged its cold, blue, spongy surface with its coarse-pointed grass for one rich carpet of velvet green. The draining and fencing of this field cost, from first to last, about £90. On account of the lease no opportunity of testing its value offered itself till December 1852. It was then let by public roup as a grass park, at £27 5s. In December 1853 it was again roup as a grass park (snow was on the ground), at £23 15s. In 1854 it was let at £24.

No. 10.—This field extends to 8 acres and 1 pole. Except a dry spot of about 2 acres, it was, prior to improvement, more bog and bent. Its average value, in 1849, was 8s. per acre. In the winter of 1848 it was drained, and in the spring following (except the dry spot which was ploughed), it was either deeply dug or half-trenched according to circumstances, and levelled. The drains were 4, 5, and often 6 feet and upwards deep, and 24 feet apart. It may here be noted that, except at the outset of his improvements, the reporter always contracted for 4-foot drains. No drain was intended to be under 4 feet. The additional depth he took out by the day, and made it more or less according to the nature of the subsoil. He has drains in several of the marshes 9 feet deep in particular spots. 6 and 7 feet was a common depth in such subsoils. A crop of oats with from 2 to 3 cwt. of guano per acre was taken. It was exceedingly patchy and irregular, and on the whole gave a very poor return. The land was limed after the removal of the oats to the extent of, say, 5 tons of shells per acre, and gave tolerable crops of hay in 1850 and 1851. It should have been stated that it was sown down with a thick coating of uncleared grass seeds, bush harrowed, except the dry spot, which was sown down in the common fashion. In spring of 1852, the whole field was deeply dug, richly manured with farmyard dung and guano, and a green crop taken. The potatoes would have given an excellent return, but for disease. The turnips were much above an average crop. Both turnips and potatoes were put in and wholly managed without horse work. In spring of 1853 the land was again dug and oats and grass seeds sown, with a second dressing of lime harrowed in. The oats (sandy and early Angus) were sold by public roup on foot, at prices ranging from £6 to £7 per acre. It was a heavy well-filled crop, but great loss sustained from the wet harvest. The grasses sown were principally perennial ryegrass and timothy.

The crop of hay was reaped this year on foot, at an average of £3 15s. per acre. To this falls to be added the sheep grazing of the faggage at 10s. per acre. The hay crop was much injured by the bulk, and consequent laying of the oat crop, as well as by the length of time the wet harvest caused it to remain on the ground. It was strong, but with many bishas. The field is intended to be cut again this season when the timothy grass is expected to have come up. As a grass park, the proprietor expects to get at least £2 per acre for this field. It was expensive to improve, costing, in road numbers, for drainage, first digging, half-trenching, levelling, and fencing, £100.

No. 11.—This field extends to 14 acres and 27 poles. The annual value of this field in 1849 could not be over 8s. per acre. It was partly thrushy swamp, partly bent, interspersed at wide intervals with dry spots, resting, as usual, on whin rock. In the autumn and winter of 1849 and spring of 1850, the field was thoroughly drained—drains 5 feet and upwards in depth and 27 feet apart. After drainage the land was ploughed where the surface permitted; where it was too rough and broken for the plough it was dug or half-trenched according to the degree of roughness, &c. In the spring of 1850 the whole was sown with sandy oats and grass seeds. As the ploughing or digging proceeded the land was wholy limed, to the extent of, say, 4 tons of shells to the acre. It was done more heavily or lightly according to the degree of toughness, some of the wider portions having a coating of earth, clay, marl, or gravel carted upon them prior to liming. As in the case of the other fields, the subsoil from the drains was used for this purpose as far as it would go. The crop of oats was very irregular. It might vary from 4 bolls up to 6 or 7 bolls per acre, but was not measured. In 1851 the hay crop would average about 1½ tons per acre. The faggage was eaten off with sheep, and after a top-dressing of soot next spring a second hay crop was taken about equal to the first. After the removal of the hay a second dressing of lime, equal in quantity to the first dressing, was applied to the wider and tougher portions of the field. In December, 1852, the field was let by public roup as a grass park, and produced £25 5s. It was grazed wholly with sheep. In December, 1853, it was again let by public roup as a grass park, and produced £24. In 1854 it was again roup as a grass park, and was let at £27 10s. The drainage, digging, fencing, and levelling of this field cost about £140.

No. 12.—This field extends to 9 acres 2 roods 13 poles. Its original state quite similar to No. 11, only a degree wider, with fewer dry spots. The only difference in the treatment was that more earth was carted on the surface, two crops of oats taken from a portion of the field with an extra coating of earth, and second liming, and that nearly the whole was surface-dressed with farmyard manure. The first oat and hay crops very similar to those of No. 11. The second oat crop and the hay following it were excellent—quite equal to the crops of the "croft" land of the district. The second oat crop had, say, 2 cwt. of guano per acre sown on the breid—the lime having been applied early in the spring, in order to afford a considerable interval between the dressings. Without such interval the writer would not approve of the application of both lime and guano to the same crop. In December, 1852, this field was let by public roup as a grass park, and produced £16 15s. In 1854 it was again roup as a grass park, when the rent rose to £16 10s. Both this field and the last (though still rough-looking and showing sprits in many places) are thoroughly dried, and grained remarkably well in 1854.

No. 13.—This field extends to 21 acres 3 roods 26 poles. It was drained in the winter of 1850 and spring of 1851. The drainage, cropping, and treatment, with the quality of crops, were very similar to those of No. 11. The rate of outlay was also much the same. The oat crop was limed at the rate of 5 tons per acre, but no second liming has been applied to any portion of the field. The wider portions were done with farmyard manure on the hay-stubbles instead of lime. About half the field has been so manured. In the spring of 1853 the sown grass was dressed with soot, and after the removal of the hay crop the faggage eaten off with sheep. In the spring of 1853 a second dressing of soot was applied; and after the removal of the second hay crop the faggage was let by public roup for sheep grazing, from 10th September till 1st April following, at £12 for the field. In December 1853, the field was let by public roup as a grass park, and produced (over above the faggage as above noted) £24. Last November 2

was again roused as a grass park, when it produced £39 10s. Prior to 1851, this field used to let out at about £8. The expense of draining, digging, and half-trenching, levelling and fencing the field was, as before stated, as near as possible £10 per acre, or £220 for the whole.

No. 14.—This field extends to 14 acres and 15 poles. It was drained in spring and summer of 1850 with 5-feet drains 30 feet apart. It had been levelled, thrown into 15-feet ridges, with deep furrows, and potatoed many years before. As after crops proved, it had been richly manured, but was perfectly saturated with water, and, except a small portion of the crown of the ridges, was one mass of strong spritts. In this state its value could not be over 16s. per acre, or the average value of the farms prior to improvement. After drainage the field was pastured during the remainder of the season. In winter, and early spring following, the field was ploughed where it would carry the horses, and dug where it would not. It would be ploughed with the exception of, say, an acre, in patches here and there. The whole was sown with oats, top-dressed with lime, and the crop produced was equal to the best in the district. It was sold by public roup on foot at from £6 to £7 per acre. After the removal of the crop, about two acres of the field were trenched 16 inches deep for carrot; the remainder of the field was again ploughed very deep for oats. The second crop was at least equal to the first. It was sold in stacks, and realised about £10 per acre. It was top-dressed with about 2 cwt. of guano per acre. The kind of oats was Sandy and Birley both years. The carrots averaged about 12 tons per acre. The Altringham and White were over this weight—the Long Red and Orange rather under it. A sample of Early Horn from the field took the district prize. The return was about £30 per acre. They were sold by public roup. In 1853, this portion of the field was sown with Tartar oats and grass seeds. The crop would have been quite extra except for the wet season. As it was it was too bulky. The remainder of the field, after being wholly half-trenched and levelled, was dressed with a variety portable manures, viz., so much with guano, so much with superphosphate of lime, so much with a mixture of saltpetre, salt, and gypsum, so much with bone dust, &c., and again sown with oats. The writer's original intention was to green-crop the whole; but being obliged to forego this intention on account of other pressing engagements, he took what he thought at the time the readiest and most profitable method of getting the land sown down. The third oat crop, though inferior to the other two, was quite above the average crops of the district. Being still bulky, the wet season laid it very much. As a further consequence of the wet and late season, the sown grasses which come up thin, unequal, and with many total blanks, gave an unsightly, and, on the whole, neither a fine nor heavy hay crop. Though strong, the thinness and blanks brought down the average to little more than 1½ tons per acre. The blanks and the thin places were re-sown, and the field heavily top-dressed with soot last spring. Though the re-sown grasses did not come up in time to mow the hay crop to any extent, they swarded the field, and the faggage was most luxuriant. It was eaten off with sheep. It was not let; but, judging from the fields that were, it was worth at least 12s. per acre. The field is to be grazed this season wholly with sheep. It is intended to follow this up with a dressing of farmyard manure, and finally with irrigation. As there is ready command of abundance of water, the field, as a meadow, will be worth £4 per acre. The expense of draining, trenching, half-trenching, levelling, and fencing this field, was about £150.

No. 15.—This field extends to 23 acres 3 roods 20 poles. It was drained in spring and summer of 1851. Drains 5 feet deep by 27 feet apart. Considerable extent of dry land in this field. In its original state it let for young cattle at from £18 to £20 per annum. The drainage, fencing, digging, and levelling, of this field cost, in round numbers, £200. In 1851 and 1852 it was grazed by the old tenant, and, on account of his leave, its increased value was not tested. In the spring of 1853 it was broken up, being for the most part ploughed, but digging being necessary to some extent all over the field. The dry portion of the field had been limed prior to drainage; the wet portions were limed immediately after it. The field was sown with sandy oats, and at same time sown down with grass seeds, perennial ryegrass and timothy predominating. The oat crop was much above the average of the district. It was sold on foot by public roup at from £6 to about £8 per

acre. After the removal of the oats, the field was dressed with farmyard manure to the extent of from thirty to forty yards per acre. On account of the bulk of the oat crop, and the length of time it remained on the ground, the young grasses came up irregularly, and showed many blanks. The hay crop was excellent in quality, but, from the causes above noted, light by the acre. It was sold in ricks, and averaged about 1½ ton per acre. If the hay was not what might have been expected, the faggage was very good, and let, up to the 1st of April, 1855, at £14. On the 2nd April this field was let by public roup as a grass park, and produced £55.

No. 16.—This field extends to 18 acres and 38 poles. It was drained in the spring of 1852—drains 5 feet deep by 30 feet apart. About 8 acres of this field was, prior to the improvements, the best land on the farms, with the exception of the meadows. The remainder was in a state very similar to No. 14. The eight acres might be worth, say, £18; the remainder of the field worth £8 per annum. In all, the field might be worth £26 per annum, but had never been let separately. The draining, fencing, digging, and levelling of this field cost about £140. After drainage the field was grazed for the season by the old tenant without any change of rent. In December, 1852, the field was let by public roup as a grass park, and notwithstanding that more than half was in a very rough state, it produced £39. Next year the field was divided by a wire fence, and the rough portion broken up. The portion left in pasture extends to 8 acres 1 rood 13 poles, and this was let as a grass park at £18 6s. 6d. In 1853 this portion was again let as a grass park, when the rent rose to £22 10s. The portion broken up was generally ploughed, but considerable pieces here and there required to be dug. The land was sown with birley oats, top-dressed with a mixture of guano, gypsum, and saltpetre salt. The crop was sold on foot by public roup, prices ranging from £8 to rather upwards of £7 per acre. After the removal of the oat crop, the rougher portions were deeply dug or half-trenched according to circumstances, and levelled. Part of the field is to be green crop, part oats, this season. The portion of this field in tillage will, in course, be at least equal in quality to the side in pasture. It is deeper land, and better sheltered.

No. 17.—This field extends to 12 acres 4 poles. Considerable portions of it were naturally dry. It would be worth about £10 per annum prior to 1853. The drainage was precisely similar to that of last field. One crop of oats was taken (1853), and the land sown down. The crop was fair, but very much spoiled before being got secured. After the removal of the oats the field was limed to the extent of, say, 5 tons of shells to the acre. The hay this year was not heavy (say 1½ tons per acre), but fine in quality. The faggage, which was luxuriant, was eaten off with sheep. It was not let, but, compared with let fields, was worth 12s. per acre. The drainage of this field, considering the comparatively limited extent required, was very arduous, owing to the whin rock. Two of the outfalls required to be carried a considerable distance through neighbouring lands. The outlay on this field, including entirely new fencing all round, was very near £100. On the 2nd of April, 1855, it was let by public roup as a grass park, and produced £23 10s.

No. 18.—This field extends to 25 acres 1 rood 32 poles. Prior to 1853 it was worth about £20 per annum. It came into the hands of the proprietor at Martinmas, 1852, when his hands were too full to allow him to attempt complete drainage. He resolved on trying the effect of shallow open drains for one crop, running these exactly on the site of the future drainage. He cut these to about the depth of common sheep drains, removed the earth thrown out to the brier portions of the field, and ploughed across them where ploughing was practicable. Where it was not practicable he dug the land. The plan, on the whole, answered so well, that in like circumstances he would adopt it again. In spring of 1853 he sowed the field with oats, and had quite a respectable crop—spoiled very much, however, as a matter of course, by the excessively wet harvest weather. The oats were rather liberally dressed with guano. Immediately after the removal of the oats, the thorough drainage was commenced. The drains were 5 feet deep where practicable, and 30 feet apart. In many of the swamps they were greatly beyond 5 feet; in the whin rock (with which this field abounded) frequently not over half that depth. As stated in No. 9, when the rock was difficult the water was allowed to drop backwards and forwards from the shallowest point of the drain. In dropping back it fell, as before stated,

into a cross drain communicating with an up-and-down drain in which difficult rook did not occur. Two heavy outfalls, extending far into the neighbouring lands, added materially to the expense of the drainage. What with rocks, outfalls, and the enhanced price of labour and materials, the expense of draining, fencing, digging or half-trenching, and levelling, this field approached £320. After drainage a second white crop, partly oats, partly barley, was taken over the greater portion of the field and the land sown down. The barley land was dressed with farm-yard manure, the oats partly with lime, partly with guano. About two acres of the field were in green crop, and four acres, after lying fallow, were sown with grasses alone, towards the end of last summer. The whole has now been limed, and several of the wilder portions were, after the removal of the oats, dressed with farm-yard manure. The second white crop was quite equal to the average of the district, and the sown grass, especially on the barley land, looks well, considering the severe and long-protracted frost. The turnips were a very bulky crop. In addition to about 40 yards of farm-yard manure per acre, they had in one place 3 cwt. guano, and over the rest soot to a similar value. The

soot took the lead, but in the long-run the crops could not be distinguished. On the contrary, a few drills sown with about 50 yards of farm-yard manure alone were strikingly inferior, both as regarded shaws and bulbs. The green cropped land will be in sown-down barley this season. The increased value of this field remains to be tested, but the proprietor does not entertain a doubt that it will let as a grass park at about £50.

Nos. 19 and 20.—These two fields extend together to 21 acres 1 rood 6 poles. They are not yet completed, and the writer does not report upon them farther than to state that, judging from what has been done, the expense of improving them will come to about £180. Their value prior to improvement would be about 30s. per acre, or, say, £32 per annum. Their new value, judging from the results produced in other fields, must be at least double that sum, one-half of the extent being intended to be irrigated, for which purpose there is ready command of abundance of water.

Without going further into particulars, this may be taken as an outline of the results of improvements carried out in circumstances where neither the soil nor climate was at all favourable.—*Journal of Agriculture.*

DRAINAGE IN RELATION TO STEAM CULTURE.

Efficient drainage has long been acknowledged the alpha and omega of successful farming on heavy clay lands. If once the air and the water are got to circulate freely through such a soil for a season or two the cause is won, for then the roots of plants will have become so completely ramified throughout the whole, and the continuous work of decomposition have begun, as to change its normal character, the tenacious, obdurate staple being thus slowly converted into a rich brown productive loam alike for mangolds and wheat.

If this was the case under the old system, when the bottom of the furrows were trampled with the horses' feet and the work of drainage thus less or more undone, how much more effective must be the action of the drains and the fertilizing process under the more auspicious efficacy of steam, when the subsoil, instead of being consolidated and rendered more impervious than before, is rent and shattered in all directions, so as greatly to promote its drainage, aëration, and fertilisation! In the former case the work of improvement is greatly retarded by the treading of the horses' feet. This every farmer of any experience must both have seen and felt, to his cost; but in the latter case, the moment the steam-plough starts and the smashing-up work begins, the whole operation from first to last is auxiliary to the above work of drainage, aëration, and fertilization of the land.

The difference is equivalent to a considerable bonus on the capital invested in the drainage of a farm. In other words, capital invested in draining under steam culture will return larger profits to the farmer and better-paid interest to the landlord than it did under horse culture. In many cases it may make the investment remunerating which previously proved a losing concern; for it is a well-known fact that there is a turning-point, which, if not gained, the ameliorating process does not continue from season to season, the little progress made in fine weather being counteracted in bad. But when once the turning-point is gained, and the work of progress fairly begun, it then goes on, after a while, at an accelerated rate, until a thorough change is effected. Such being the case, it is all but manifest that the favourable effects produced upon the subsoil by the steam plough may turn the balance in favour of the ameliorating process where previously little or no permanent advance was made. In point of fact, many actual examples might be quoted in support of this conclusion.

The general benefit gained, however, will depend much upon how each of the two auxiliary works of drainage and steam culture is performed. Although the steam plough and cultivator may turn the balance when the scales are previously nearly in a state of equilibrium, yet an ounce more, figuratively speaking, may leave the odds against both the drains and steam, so that a two-fold loss would, under such short-sighted circumstances, be sustained. And this, too, does not

represent all the dark and losing features of the case, for when drainage is improperly performed, and when part is left to be done by the steam plough, as it were, then such must detract from the immediate advantages that would otherwise be gained by steam culture. It requires no detailed argument, therefore, to show that the greatest benefit gained is when both works are properly performed—i. e., when drainage is of itself a complete success. Then steam culture will in the highest degree be remunerating to the farmer.

To gain the greatest or maximum benefits arising from steam culture the land cultivated must be in a thoroughly drained state. Those who calculate that the advantages of the one will make up the short-comings of the other, do justice to neither. On the contrary, they do a very serious injustice to both, their short-sighted calculations being evidently amongst the strongest barriers that can be thrown before the wheel of progress in either of these two important branches of modern farm practice. Thus, if one farmer (A), whose lands are thoroughly drained, adopts the steam-plough, and thereby realises the maximum benefits from both; and if two other farmers, (B and C), whose farms are very imperfectly drained, adopt the same system of steam culture, but fall far short of the former as to results in harvest, the verdict of the two (B and C), is more likely to be heard against the seven-gangled systems than the case of the one A to the contrary; for the success of A will be attributed to the natural fertility of his land, or to some other cause than his own skill in drainage, while B and C will shuffle in various ways before they admit their practice in the drainage of their land to be otherwise than personally creditable to themselves. To this rule there may, no doubt, be many generous and charitable exceptions, as we trust there are, where farmers not only have certain heartburnings about the drainage of their land, but who candidly confess that when draining they sadly miscalculated both the depth and distance between the drains, and, consequently, that a permanent sacrifice has to be sustained without a grumble. But granting this, and everything more that may be needful to any in this direction, the rule, nevertheless, has a very wide application amongst the great body of practical agriculturists, so that the general conclusion is manifest, as regards the steam-plough. Exactly the counterpart is true in reference to drainage; for if A has adopted steam culture before draining his land, and if he arrives at the practical conclusion that, with steam as an auxiliary, the thorough drainage of his land will yield ample profits over and above the landlord's interest on the capital invested, and therefore enters into arrangements accordingly, and has his farm thoroughly drained, and eventually reaps the full realisation of his calculations in harvest; and if B and C arrive at a similar conclusion that with steam, drainage will pay, because the drains can be placed so much farther asunder, and thus only cost something like half the outlay and interest;

when harvest comes, and when the bushel measures out their narrow-minded penny-wise economy, what will the conclusion be at that eventful period? For one that will plead guilty to the premises, how many are there who will saddle the steam-horse with half the blame, and the drains with the remainder, thus getting, as they themselves aver, out of the new-fangled speculation with clean hands and an easy conscience!

The sound practice is to make each of the two mechanical agents—the drain and steam-plough—perform its own legitimate function. In horse culture, to have a good-going plough it is essentially necessary that both horses pull fairly together, so as to keep up their respective ends of the “yoke,” or whiplash-tree; for if the one falls behind the other, the upshot need not be told to the practical reader. Exactly similar is the conclusion arrived at relative to draining and steam-ploughing; for if more is left to the one to do than its own normal share, the unfortunate result is, that neither, under such circumstances, does so much as it otherwise would. The drains do little, and the steam-plough does less, and thus the pennywise economist resps, as he justly ought to do, the produce of his own shortcomings.

To this there is no doubt one set-off, viz., that under horse-culture the trampling feet of the teams did harm, so that under steam-culture the drains may be placed further asunder. Thus, under the former the drains were not allowed to perform their normal function by reason of the consolidation of the subsoil by the horses' feet. Under the old system it therefore follows that farmers have no experience as to the effects which drains would produce if left free to act, apart from this consolidation; but the facts of the case warrant the conclusion arrived at above by B and C, that under steam culture the drains may be placed further asunder, and yet prove more effective in the drainage of the land.

There is thus an auxiliary relation existing between drainage and steam ploughing, that requires to be closely investigated at the present time. Thus the questions naturally arise for solution, in the examples of all who are now adopting steam culture for the first time, What effect will it have upon the drainage of their fields? Will it be more efficient than under horses? To this latter an affirmative answer may at once be given; but when the more general and important problem is raised for solution, viz., Is the relation between the two such as to produce the greatest return in harvest? then it is by no means so easy to append a satisfactory answer, even when the harvest is over, and when the bushel and balance have pronounced their respective awards.

The practical reason of this may be told in a very few words. Thus, if the drains are eighteen or twenty-four feet apart, and if the land is ploughed or smashed up to a given depth, say nine or ten inches, then the quantity and quality of produce yielded under such conditions in harvest can only be received as the limited evidence arising from those peculiar circumstances. The farmer may be a gainer, and even have much reason to be satisfied with what he has done; but that is no proof that he has attained to the highest and most profitable relation that can exist between the drainage and steam culture of his land, for had the drains only been twelve or fifteen feet apart, the produce of the harvest might have been much more remunerating, the extra increase in the quantity and quality doing more than covering the interest on the extra outlay of capital in draining.

The subject involving the differences between the returns in harvest, and the corresponding differences between the interest on the greater outlay for drainage, when properly performed, and the less investment when improperly executed, is one not sufficiently understood, practically speaking. Much has been said and written about the depth of drains, and the distance they should be asunder; but, rules thus prematurely laid down are, for the most part, dogmatical empiricism, falling infinitely short of the necessary data required to give them a common-place currency in applied science. But even granting, for the sake of argument, that they come up to the standard requirements of “Practice with Science,” they nevertheless furnish no tangible demonstration whatever, good, bad, or indifferent, of our proposition. If a field, for example, has been drained by drains four feet deep and 20 feet apart, the increase of the produce in harvest, and the difference of the expense in working and seeding the land, may be taken as the index of the benefits gained; but such furnish no evidence of the result which would be produced

were the drains only ten feet apart. The “broad gauge,” if we may use the phrase, may pay the farmer well; but the “narrow gauge” may pay him better, for aught that the above experiment proves to the contrary.

The practical difficulty experienced in the investigation of the subject, so as to procure trustworthy evidence, arises from drainage being a permanent work, or from the permanent nature of the work of draining land. Ploughing is performed annually, and occasionally, as in the case of autumn tillage, spring or summer fallowing, several times in a single season; but it is otherwise with the operation of draining, for a properly-executed drain is presumed to be a permanent work—the placing of a mechanical agent in the soil, that will perform its function whenever rain falls in a greater quantity than the absorbent powers of the land can retain within its pores. If the land half-way between the drains is not drained when the drains are placed twenty-four or thirty feet apart, an intermediate drain may, under such circumstances, be cut between every two. This has frequently been done to advantage, although the total outlay thus incurred is somewhat greater than double the original. But, even under such conditions, the evidence furnished remains of a limited character, being exclusively confined each to its own individual case; while the general doctrine taught by the success that attends the practice is, that the drains should be placed nearer to each other than they ordinarily are, so as to produce the greatest effect in the drainage of the land, and the highest degree of fertility in its amelioration.

Such data strongly fortify the conclusion now commonly arrived at by many practical agriculturists, that to increase the auxiliary relation between drainage and steam-culture to a maximum, so as to produce the greatest possible result, the drains should be placed nearer to each other than they generally are. Although tangible evidence is wanting, for the reasons stated in the last paragraph, to establish the truth of this conclusion on a satisfactory experimental basis, so as to justify its adoption as a settled question in applied science, there is, nevertheless, sufficient experimental evidence to justify its adoption as an approximate rule by which to arrive at a final and satisfactory answer to the question at issue. In other words, the conclusion embraces a large proportion of the facts of the case, and the line of direction, so to speak, in which the whole lie, and therefore may be found; so that if agriculturists would place intermediate drains between those already in operation, at different distances and depths, it would further lead to the permanent solution of the practical question. In an experimental inquiry of this kind landowners might well afford to join their tenants by advancing the capital required for the drains, provided the latter undertook, on their part, to conduct with fidelity the details of the experiments; and if the two interested parties would thus join and fairly pull together at the work, the result would unquestionably prove that an immense amount of capital can yet be profitably invested at redeeming interest in the drainage and steam cultivation of land.

SALT AS A MANURE.—Mr. Fras. Mewburn, Larchfield, Darlington, has addressed a circular to the farmers in the county of Durham, and in Cleveland, informing them that the Liverpool Chamber of Commerce employed Dr. Phipson to report on salt as a manure, and the following were his conclusions:—“1. That without a due proportion of salt, plants cannot attain their proper degree of perfection; and this applies especially to colza, turnips, swedes, beet, spinach, wheat, oats, maize, and other grasses. 2. That salt is an essential constituent of plants as well as animals. 3. That the soil is constantly losing, by cultivation, a great amount of salt, taken away by the crops. 4. That none of the manures at present used (except a very few of the best superphosphates) contain any salt; even guano shows only four-tenths per cent. 5. That it is necessary to add salt at regular intervals to the soil, in some shape or other, if we wish to derive the greatest possible benefit by our crops.” Mr. Mewburn believes that salt will be furnished in great abundance, and cheap, in the county of Durham and in Cleveland, and expresses a hope that the farmers in those districts will test the doctor's “conclusions” by extensively using salt on their tillage land.

**MANAGEMENT OF A BREEDING HERD OF CATTLE UPON AN ARABLE FARM,
WHERE A BREEDING FLOCK OF EWES ARE KEPT, AND WHERE THE NATURAL PASTURE
DOES NOT EXCEED ONE-FIFTH THE AREA OF THE FARM.**

THE PRIZE ESSAY OF THE ROSS SOCIETY.

BY CLEMENT CADLE, SECRETARY OF THE ROSS AGRICULTURAL SOCIETY.

The question of stock *versus* corn is one that often comes before us as agriculturists, and is often discussed; but, as is frequently the case where each side has warm partisans in its favour, there is much to be said on both sides; it depends upon circumstances what merit should be attached to either one or the other. My own view is that in the majority of cases stock and corn are so inseparably joined together that the more stock you keep the more corn you will grow; and on the other hand, the more corn you grow the more stock will be required to consume the straw and intermediate crops, as the case may be. This brings me to consider the profitable and economical way to convert the straw into manure. I will first take the common way of converting straw into manure, and then notice the system in a scientific point of view, afterwards proceeding to the advantages of breeding cattle upon an arable farm; for unless you first recognise the necessity of keeping horned stock on an arable farm, for the purpose of this conversion of straw, they will be unable upon their own merits successfully to compete with sheep. The common practice with regard to the conversion of straw into manure upon an arable farm with only one-fifth natural pasture (which in all my remarks I shall presume to be the case, unless mentioned to the contrary), would divide itself under three heads: first, of a heavy wet soil, where no sheep can be kept; second, a medium soil, where a portion of the stock consisted of sheep, such as breeding ewes; and third, a light sheep soil, where sheep are fatted, and are the most profitable stock that can be kept. First, on heavy soil which will not carry sheep. Here the farmer is in a manner compelled to keep cattle, as he has no alternative. There is very little difficulty in the consumption of straw, as from the quantity of stock kept it is generally well trodden into manure, some portion of late years being cut up into chaff and given with oilcake or meal, another portion being used as litter for horses and fat cattle, while the greater portion is strewed and thrown about the fold yards; in many cases being first picked over by the stock. Indeed on this class of farms, until the recent introduction of chaff cutting and oilcake, this picking over straw was the only food a majority of the stock ever received, as the small quantity of roots grown were all required for fattening stock. Next, on the medium class of farms the difficulty of converting straw is not so great, as this kind of soil under proper management is generally the best for the production of large crops of roots, and in consequence of this a large stock of fattening cattle is kept, these being required for the consumption of roots, the land being too tender and wet to consume many of the roots on the land with sheep during the winter months; but still here, as in the last case, the folds are strewed with large quantities of straw, and often the same system pursued of putting the cattle to pick it over, with this difference, that on this class of farms the cattle get a few swedes or turnips with it. Thirdly, on the light sheep soil the difficulty of properly consuming straw is very great, because, in consequence of the lightness of the soil, it is requisite to keep all the sheep possible to tread and firm the soil, as without this firmness many of these soils will not grow corn; and further, because of the profit which of late years has attended the winter feeding of sheep the farmer is tempted to let everything else make way before this, his first care. In consequence of these two cases, and also of the small profit attending the keeping of cattle in the winter, the quantity of roots hauled off is very small, and thus the straw is almost considered a nuisance, on this class of farms, and in many instances is treated as such, often remaining for a year, and sometimes two or three, in a stack in the corner of the rickyard, or in a field half a mile from the homestead, roadways being strewed with it knee-deep, and almost every device that can be imagined is employed to get rid of it, short of breaking the agreement with the landlord by selling it off the farm or setting fire to it, and in some few

instances this has been done. The cattle actually kept in oftentimes not half the quantity requisite for the proper trading of straw where that system is adopted, and I have even heard of a boy being put to drive the cattle about the fold, so as to get as much straw trodden as possible during a wet season; likewise where the horses have to go along a lane for some distance to water, I have known that lane strewed with straw all the way to the pool, even one to two hundred yards; hence I apprehend it is chiefly this class of arable farms to which the essay should principally apply, especially as the wording of the premium concludes with the terms "where a breeding flock of ewes are kept." Having now taken a view of the common practice of the disposal of straw, I will next proceed to make a few remarks on the scientific part of the conversion of straw into manure, and give first the composition of straw of wheat, of barley, and of oats. Straw of—

	Wheat.	Barley.	Oats.
Water	14.23 ..	14.30 ..	12.06 ..
Flesh-forming matter	1.79 ..	1.68 ..	1.63 ..
Respiratory and fattening matters ..	31.06 ..	39.98 ..	37.86 ..
Woody fibre	45.45 ..	39.80 ..	37.86 ..
Mineral matters (ash)	7.47 ..	4.24 ..	4.85 ..
	100.00 ..	100.00 ..	100.00 ..

And these mineral matters were composed of

Potash	12.14 ..	18.40 ..	19.14 ..
Soda	.60 ..	.68 ..	9.69 ..
Magnesia	6.23 ..	8.08 ..	8.07 ..
Lime	2.74 ..	4.13 ..	3.78 ..
Phosphoric acid	5.43 ..	3.26 ..	2.56 ..
Sulphuric acid	3.88 ..	2.13 ..	3.26 ..
Silica	67.88 ..	54.56 ..	43.60 ..
Peroxide of iron	.74 ..	3.33 ..	1.83 ..
Chloride of sodium	.22 ..	6.95 ..	— ..

It will be seen from the foregoing table, that however valuable straw may be to make bulk with concentrated foods, it is ill adapted to be used by itself as food for cattle, on account of the large amount to be digested before the animal gets sufficient for its natural wants.

Composition of fresh and rotten farm-yard manure, composed of horse, pig, and cow dung, as given by Dr. Voelcker—

	Fresh, 14 days old.	Rotten.
Water	66.170 ..	75.430 ..
Soluble organic matter*	2.480 ..	3.700 ..
SOLUBLE INORGANIC MATTER (ASH):		
Soluble silica	.237 ..	.254 ..
Phosphate of lime	.399 ..	.383 ..
Lime	.066 ..	.117 ..
Magnesia	.011 ..	.047 ..
Potash	.573 ..	.446 ..
Soda	.051 ..	.023 ..
Chloride of sodium	.030 ..	.037 ..
Sulphuric acid	.055 ..	.058 ..
Carbonic acid and loss	.218 ..	.106 ..
Insoluble organic matter†	25.76 ..	13.32 ..
INSOLUBLE INORGANIC MATTER (ASH):		
Soluble silica	.967 ..	1.434 ..
Insoluble ditto	.561 ..	1.010 ..
Oxides of iron, alumina with phosphates‡ ..	.596 ..	.947 ..
Lime	1.120 ..	1.667 ..
Magnesia	.143 ..	.091 ..
Potash	.099 ..	.045 ..
Soda	.019 ..	.038 ..
Sulphuric acid	.061 ..	.063 ..
Carbonic acid and loss, ...	.484 ..	1.386 ..
	100.000 ..	100.000 ..

	Fresh, 14 days old.	Rotten.
* Containing nitrogen.. ..	.149 ..	.297
Equal to ammonia	.181 ..	.360
† Containing nitrogen.. ..	.494 ..	.309
Equal to ammonia	.599 ..	.375
‡ Containing phosphoric acid	.178 ..	.374
Equal to bone earth	.386 ..	.573

WHOLE MANURE CONTAINS AMMONIA—

In free state.. ..	.034 ..	.046
In form of salts	.088 ..	.057

It will be seen from the foregoing analyses that mere rotten straw and mixed farm-yard manure are different in many respects, and as farm-yard manure is still the general manure of the farm, I would strongly impress the importance to be attached to the production of a good article, and having made a good article I should strongly recommend (in the absence of covered homesteads) the application of such manure direct to the soil, and not to allow it to waste itself on some wayside by the washing of rain for six months, until the farmer has nothing else to do except to haul it out. I say the washing of rain, as it is an erroneous idea which is gradually dying out to suppose that ammonia is lost to any serious extent in the air, by the evaporation during fermentation of a dung-heap (see Dr. Voelcker, on farm-yard manures, a small pamphlet, which should be in the possession of every agriculturist). This any one can prove by suspending some test paper over a dung-heap while fermentation is going on; and Dr. Voelcker's experiments have proved that the ammonia is condensed in the colder portions of the heap, before coming in direct contact with the air, except during the removal of hot manure, when there is some loss. I need say very little upon the system of rotting straw; of course, if you merely rot the straw, you have only straw and water to return to the land. While on this subject, there is one point I have often argued against, and

many persons of great intelligence still retain the same idea, viz., that straw alone is a better manure after passing through a beast than it would be as rotten straw; but I would ask such persons, upon what the animal lives? If you only give it straw, nourishment must be taken from such straw; consequently the value of the manure would be lessened by the amount which the animal had abstracted; although bulk for bulk that which has passed through an animal may be the best manure, as it would represent much more straw in a smaller compass, and in a more concentrated form. There is no doubt that straw is greatly improved for manure by being passed through a fat beast with other and more concentrated food, and also in a less degree with store cattle, which have a plentiful supply of roots and oilcake mixed with the straw. The point I would wish to impress is this:—That as an animal requires so much carbon for respiration, and so much of albuminous substances for the purpose of keeping up the wear and tear of the muscles, skin, &c.; so an animal requires as much of these substances every day. If the animal is only supplied with just the quantity of these constituents required for present use, it is so much thrown away; for it is in the improvement of animals upon which a farmer gets his profit, and if they get no better, the food consumed is lost; on the other hand, when the animal is given more than is required for such daily wear and tear, nature comes in and allows the animal to retain the excess, putting it by in the shape of fat and flesh, thus making provision, as it were, for a rainy day; and it is this excess upon which a farmer must depend for his profit. I will here give the experiments lately made by the secretary and members of the Morayshire Farmers' Club upon feeding cattle (see *Mark Lane Express*, March 16th, 1863), which certainly do not show much profit; but, of course, if you sell your roots at 10s. per ton, and hay at £3, you can scarcely expect to get a second profit in the cattle—

	Weight when put up to feed.	Weight when finished.	Gain in Weight.	Gain in money at 6s. per lb.	Quantity of Turnips consumed.	Cost of Turnips at 10s. per ton.	Profit.	Loss.
FIRST PAIR—Turnips and Straw—	Cwt. lb.	Cwt. lb.	Cwt. lb.	£ s. d.	Tons cwt. lb.	£ s. d.	s.	£ s. d.
No. 1	10 14	11 42	} 2 70	7 7 0	18 18 0	6 19 0	9	—
No. 2	8 56	9 98						
SECOND PAIR—Turnips and Oilcake, 4lb.—								
No. 1	9 84	10 84	} 2 70	7 7 0	11 16 0	5 18 0		
No. 2	8 84	10 56						
					Do. of Oilcake, 2 2 5			
THIRD PAIR—Turnips, 2lb. of Cake, and 2lb. of Beans meal—						8 0 5	—	0 13 5
No. 1	10 0	11 28	} 2 14	5 19 0	13 18 0	6 19 0		
No. 2	8 56	9 42						
					Oilcake, 2 2 5			
FOURTH PAIR—Turnips with Linseed and Bruised Oats, equal in money value to 4 lbs. of Cake—						9 1 5	—	3 2 5
No. 1	10 56	11 0	} 1 84	4 18 0	11 4 56	5 12 3	—	0 14 8
No. 2	9 56	10 84						
FIFTH PAIR—Turnips and Hay—								
No. 1	9 56	10 42	} 2 14	5 19 0	13 16 56	6 18 3		
No. 2	9 28	10 56						
					Hay in addition, 1 4 9			
SIXTH PAIR—Turnips with Rapecake and Locust Beans—						8 3 0	—	2 4 0
No. 1	9 56	10 84	} 2 0	5 12 0	11 5 0	5 12 7		
No. 2	8 56	9 28						
					Amount of Locust Beans, Rapecake, &c. 1 7 5			
						7 0 0	—	1 8 0

Professor Anderson says, on the subject of feeding stock: "The food divides itself into three classes—viz., 1st, nitrogenous or flesh-forming matters; 2nd, saccharine and oily matters for respiration, and to form fat; 3rd, mineral matters. If the nitrogenous and respiratory elements are not in proper proportions, whichever is in excess over this proportion will be lost, on account of the animal consuming

food sufficient to supply the deficiency of the other element. Fat greatly preponderates over the lean. A lean sheep, for instance, contains half a pound of fat for every pound of dry nitrogenous matter, while when very fat it may contain six times as much fat as lean; hence, the food should contain a very large quantity of non-nitrogenous matters. It appears that while one-tenth of the saccharine or fatty mat-

ters is assimilated by the animal, only one-twentieth of the nitrogenous compounds and one-thirty-third of the mineral substances in the food are assimilated by the animal. Thus a pound of fat in the food when assimilation takes place will produce a pound of fat in the animal, but it requires about 2½ lbs. of sugar or starch to produce the same effect. It also appears from Bousingault that a cow requires eighteen ounces of nitrogenous matter to counterbalance the waste of the tissues, a quantity contained in about ten or twelve pounds of wheat flour; and it is well known that an ox requires four or five pounds of carbon daily for respiration, to supply which 100lbs. of turnips are required. Hence the importance of the diminution of muscular exertion, and the keeping the animals warm, so that a small quantity of food may be required to act as fuel to maintain the animal heat, are most important considerations." This resolves itself to what I have before stated, viz., that it takes a certain quantity of food to keep an animal alive, and if you only supply it with that quantity it makes no improvement, and consequently no profit, and that portion of the food is lost; but, on the other hand, all the food given in excess of the daily required supply which the animal can profitably retain in its system would improve the animal, and consequently be a profit to the farmer; and any supply which the animal cannot or does not assimilate into its system is expelled in the manure, and this manure should therefore be taken great care of. I will now proceed to the principal part of the subject, viz., the management of a breeding herd of cattle upon an arable farm where a flock of breeding ewes are kept, and where the natural pasture does not exceed one-fifth the area; and I cannot do better than take a moderate-sized farm of this description and apportion it out by different crops and kinds of stock. Take a farm of, say 250 acres, then we should have fifty acres of natural pasture, fifty acres of roots, fifty acres of barley, fifty acres of clover, and fifty acres of wheat upon the most common or four-course system; and, as I suppose it to be good land, this with the assistance of plenty of artificial food, would keep ten horses, one of which would be a hackney for the farmer's own use; a herd of twelve breeding cows and their produce, which would probably be six two years old steers, six two years old heifers, twelve yearlings, and twelve calves; and say a flock of 120 ewes and their produce, which would also probably be sixty wether lambs, sixty ewe lambs, and either sixty yearling ewes, or sixty draft ewes, according to the time of year, with two rams. These different items carried out in a tabular form would be—Horses: *9 working, 1 hack; total 10. Cattle: 12 cows, 12 calves, 12 yearlings, 6 steers, 6 heifers, 1 bull; total 49. Sheep: 120 ewes, 60 wether lambs, 60 ewe ditto, 60 draft ewes, 2 rams; total 302. As the most plentiful time of keep would be during the winter months, on account of the roots, there should always be the most stock during that time, and in my opinion this would be best carried out by having the calves dropped late in the autumn—November or December; the six barren cows would then go into the stalls, and be sold out fat at Candlemas or Easter; and the six two years old steers fat at the 1st of May. The draft ewes would either be fed out or sold, according to circumstances, and the probability of turnip crops. The crops for their support would probably be as follows:—Wheat straw for litter, barley straw for cutting up into chaff, clover twenty acres for horses, or two acres for each horse; twenty-two acres for sheep, and the worst eight acres of the clover crop to be ploughed up, when in young seeds immediately after harvest, and planted with cabbage; this being a summer crop should not interfere with the root crop; then of the fifty acres of roots thirty should be of swedes, twelve of common turnips, for ewes during yearling in spring, and eight of mangolds, for consumption after the 1st of May following; these if properly stored will be a great assistance all the summer, and with the eight acres of cabbage, fifty acres of grass (one-third, or say sixteen acres of which will be mown for the fattening stock in winter), also by occasionally mowing a little clover either from the horses or sheep, where it can be spared, will fully provide for the cattle stock during the summer months. Having now dis-

posed of the crops, I will proceed to the management of the cattle. These will require a good deal of thought and care, as to the particular kind or description to be kept; and this point is not so much a question of different breeds, as of the make and disposition of the individual animal, which should be 1st, of large frame, for the more you prepare the food, and the less exertion any animal has to make to get its living, the larger you want the frame of the animal to be to pay the most profit for such preparation; on the other hand, a small-framed animal will thrive and do well on poorer pastures, where a great amount of exertion is necessary to get sufficient food, and the larger-framed beast would starve. Contrast the Scot or Devon with the higher-fed Hereford or shorthorn. 2nd. The frame should be in good proportion with the hind legs, well back, to throw a level back, and the fore-legs well forward, to put the shoulder blades in a slanting position; this is the more necessary, both to fill up the flat side often found behind the shoulder, and also to allow a good prominent chest with greater width between the fore-legs; this large chest is very necessary in all beasts kept partially in confinement, as it indicates large lungs and good constitution; and although an animal with large lungs will consume more carbon (or food) than a small-lunged beast, in consequence of the greater respiration, still it is not so much the quantity an animal eats, as the use the food is put to; and an animal with a good constitution will often get fat where another makes no progress. 3rd. Of good temper or disposition; this point of the animal is never sufficiently attended to—for an irritable animal which is frightened or disturbed at every movement never does so well as a quiet animal not so disturbed. I recollect a gentleman who was noted for fattening sheep, once telling me, that he liked to have sheep that would fill themselves, and that when laid down would let the dog run over their backs without getting up. 4th. It is also requisite to have a good thick mellow skin; and upon this point I cannot do better than quote an extract from a letter written by Mr. W. H. Sotham, to the *Mark Lane Express*, April 27th, 1868. "A uniformly thick mellow skin is of the greatest importance; it invariably goes along with a good quality of beef; while a thin skin generally covers blubbery fat, such as deludes the judges, makes butchers swear, and their customers grumble. Animals with such hides frequently give abundance of milk, but it is always thin and creamless; whereas beef and butter both lie under the thick mellow hide." Having fixed upon the kind of beast suited for the requirements of the farm, we will suppose the calves dropped in the autumn, as before mentioned, unless the cows are required for milking, in which case the system must be altered to suit the views of the farmer, but as this would not be the case in the majority of instances on the class of farm referred to, I will keep to the breeding stock only. As the calves come they should be removed to the house and be kept in; the cows being brought into the house night and morning to them, and as soon as they can eat should have some cake, flour, chaff, and roots, placed in small quantities at a time before them. The cows during this time will do well, as I have proved for three seasons, on barley straw out into chaff and mixed with pulped roots, and if a little cake or flour is mixed it will be so much the better. Brewers' grains salted, when fresh, and mixed with it, I also found last winter a good assistance in helping out the roots, and has also the advantage of being cheap. I was rather afraid of its scouring the calves, but after using upwards of a hundred bushels last winter, I had scarcely a calf scoured the whole time. The six barren cows would be tied up to feed on roots, hay, and flour, either pulped or not as may be thought expedient. The six steers will be beat in a small warm fold-yard, and should have a good allowance of roots and hay, or instead of the hay an equivalent of cut straw and oilcake till Candlemas; after which time they should be pushed on as much as possible, as they must be sold in May, as soon as the swedes are gone. The heifers and yearlings will do in separate fold-yards, where they should be kept warm, and have plenty of food given in small quantities, and often, rather than larger quantities at a time. Cut straw and roots, with an allowance of oilcake, will keep these in good condition. The next consideration is to provide food for this stock. I mentioned growing 30 acres of swedes, which at 20 tons to the acre, would produce 600 tons; one-half

* Seven or eight horses would work the quantity of land, if of free nature, and working them out as slaves, instead of buying colts and selling them when they reach six years of age.

these are to be hauled off the land for the cattle, the other half left for the sheep. These 300 tons should be apportioned as follows:—Take the days on which the stock would be living on winter produce at 168 days, or the six shorter months, then the cows and calves between them should have one cwt. of roots to each pair, three-quarters of a cwt. to a cow, and one quarter of a cwt. to a calf, which would take 100 tons; six barren cows $1\frac{1}{2}$ cwt. of roots for four months, 42 tons; six steers 1 cwt. each for 108 days, 60 tons; six heifers, three-quarters of a cwt. each, 37 tons; and the yearlings, one-half cwt. each, 50 tons: total, 279 tons, leaving 21 tons for bull, if kept, or other contingencies. The 16 acres of grass should cut 24 tons of hay, and this would provide for the steers, fat cows, and young calves; and if not sufficient a small quantity of straw can be daily mixed in the cutting up. The store cattle will consume the cut barley straw if harvested in good condition; when not so, it may sometimes be better replaced by sweet wheaten straw, for the chaff, seasoned with a good allowance of oilcake, and the bad barley-straw used for litter in its stead. We have now to consider the summer keep of the cattle. I should recommend the calves to be weaned at the 1st of May, and the cows dried, as they would then be able to keep themselves on half the pasture they would require if giving milk, and with plenty of water would do very well with half an acre per cow during the first part of the summer, or till after mowing. This would take six acres, and 10 for mowing—22 acres. After mowing, the barren cows should be separated, if possible, and put on the lattermath to get in good condition for the stalls by the middle of October, so that the other cows would still do on the six acres; but should they at any time get very short of grass during the summer, they should have a few mangolds given them on the grass. The six two-year-old heifers would be as well put with the cows, if the number of acres of pasture be increased for them in proportion; or if the pasture fields are small, they can be kept by themselves. In either case they will at this age (if kept in good condition when young) live hard and keep themselves in good condition now; so we must allow them three acres—25 acres; and if we allow a field of 10 acres to meet contingencies for horses, sometimes for sheep, and occasionally for this 18 head of stock, when short, we may consider these amply provided for. This makes 35 acres, leaving 15 acres for the yearlings and calves, and it is with these that the greatest care is requisite, for it is a well known fact that if young stock are kept in good condition while they are young, they will be sure to keep themselves well when they get older. The yearlings, 12 in number, should have 10 acres allotted to them, and every night brought into the fold-yards, and have a feed night and morning of chaff and pulped mangolds, and it would be a good help to them to have an acre or so of the grass kept up to mow, so as to have a small portion to cut with the straw; or a small portion of clover or vetches may be used for that purpose; but by all means let them lie in the fold-yards at night, as in our variable climate they often catch cold from lying on the wet ground, and are thrown back months, which would not be the case if they had some warm folds to lie in; and when once they are accustomed to come in it will be very little trouble, as they will always be ready to come in. Should the mangolds run short, there is the cabbage to fall back upon, for you may be sure the better condition your yearlings are kept in, the better they will keep themselves afterwards. Our next and last care is the calves, and with these too much care cannot be taken; they should only be let out in the fold yards for the first few days, choosing dry ones, so as to gradually accustom their systems to the change; they may then be allowed to run out in the meadow having the remaining five acres of grass. These must be managed much in the same way as the yearlings, being brought into warm sheds every night, where they must have a liberal allowance of cut cabbage and hay with some oilcake, or old beans mixed with it. It is important to keep the calves in as good condition as they are when weaned, for once they get poor nothing will make them thrive, and they lose at least three months' growth, and of course a corresponding profit to the farmer. There is one point I omitted to mention when speaking of the root crops: it is better to plant a succession of cabbage to follow each other rather than to plant the crop all at the same time. Those planted in the autumn should be some

of the early garden sorts, also the first planted in the spring. Some of these will be fit to cut in May, and should not be cut too low, as they will shoot out and produce a second crop. The last planting should be of the ox cabbage, to come in for autumn use. I believe I have now given full instructions as to how a breeding stock of cattle may be kept with a plentiful allowance of artificial food on an arable farm where the natural pasture does not exceed one-fifth the area of the farm; of course, if the farm is double the size I have mentioned, double the quantity of stock, &c., in proportion; and if the natural pasture does not reach one-fifth, it is only to vary the system a little, and grow more mangolds, cabbage, &c., as the case may be. Before leaving the subject, there is a little variation I should recommend when the pasture is on inferior sandy land, and that is to let the cows and two years old heifers graze together in one lot, and the yearlings and calves by day in another, and to so apportion the grazing land out that the stock can be changed every week or nine days, the yearlings and calves going first, and being brought into the fold-yards at night, and fed separately night and morning as before described. These are followed in their pastures by the cows and two years old heifers to clear up the grass left by the younger stock, which like to pick a bit here and a bit there, and consequently do better for a change. The stock all do better during the autumn months on this kind of pasture, upon this system of change, for I have found from experience that when once the grass is allowed to get long or run to seed on this class of soil, no kind of stock like it, thrive on it, or will eat it, unless absolutely obliged to; the consequence is, that not only is this grass lost till winter, but also the grass that would grow there during the autumn. There is another way to remedy this evil, and that is to put a man to mow or cut a small portion every day, and the cattle will pick it up when partially withered. This system of keeping so large a stock of cattle with so many sheep on this sized farm, without question, requires management and regularity of attention, with plenty of artificial foods, but is perfectly practicable, as with some variation it is a system adopted by myself; and I am sure many farmers would not only find the cattle pay better than buying in steers to winter, but would find it pay threefold in the corn they would grow after the first year or so, by the increased valuable farm-yard manure produced by adopting this system. Of course, by this system I do not mean for any one to confine himself to the exact rules laid down, but to vary it according to circumstances, such as size of holding, quantity of permanent pasture, suitability of homestead, own inclination, &c.; as for instance, some prefer having their heifers to calve at two years old—this would involve better keep for them while young; also variation in the course of cropping: some may prefer a five or six-course shift, and so keep their seeds down two years, and thus increase their stock of green food, and at the same time reduce their horses one-third; but it is always best in either case to keep young growing horses, and have one or two extra to sell out at six or seven years old, and by this means take advantage of the seasons to work the land, than by having one or two too little to lose the planting of a crop in proper season during critical weather.

"The eye of the master doeth more than both his hands."

GRASS AND MALT.—Mr. Cayley, of Wydale, has made some practical remarks upon grass lands, in support of observations delivered by Mr. Dent, M.P., at the Scarborough and Hackness agricultural meeting, that the grass lands of the locality were not half-farmed. It is obvious, says Mr. Cayley, to any one with the slightest amount of chemical knowledge, that if you turn out of a pasture to a butcher a dozen fat beasts that have been calved there, bred there, and fed there, their bones and carcasses must have come out of the land. Bone consists mainly of lime and phosphorus in combination, but the rest of the carcass mainly of nitrogen, hydrogen, carbon, and oxygen, all of which the land obtains to a certain extent from the air and water; lime and phosphorus being solid bodies, the land can get neither from the air nor water, and when exhausted they must be supplied artificially, or stock will not do on it. There is both lime and phosphorus in milk and cheese. If cheese or milk be taken from land long

together, without return, lime and phosphorus must be restored to it, or it will become barren, according to theory. The Cheshire practice is entirely in accordance with the theory. Mr. Cayley believes that he is the only person in the neighbourhood who has tried the experiment, and it has answered; the place where the bones were laid has a totally different skin from the rest of the field. The proper cultivation of grass and the proper mode of converting tillage to grass are of growing importance to the farmer and landlord. The low prices that seem to threaten us will sooner or later make this a grass country; and thereupon arises a rather curious point. The world has been much surprised at the decrease of stock in Ireland. It has been suggested by a large practical farmer that the solution is very simple, and is merely this—that 100 acres of moderate land farmed as a tillage farm, carries more stock than the same 100 acres would if converted to grass, and that the gradual conversion of the poorer Irish land to grass is the cause of the decrease of stock. This seems to hold with the average of land—say worth £1 per acre or thereabouts; but whether it holds with respect to land of a first-rate quality seems more doubtful. Here is a nut for readers to crack. If the proposition be true to its full extent, it

seems to amount to this—that in the long run cheap foreign corn will produce dear home-grown butcher's meat, and experience seems to point to the same result. The unnaturally low price of corn will compel the farmer to lay his land to grass, which may pay the farmer and landlord because of the saving of labour. But the saving of labour is the ruin of the labourer, who is driven to the colonies; a result regarded with equanimity by our statesmen who have sucked the pap of Manchester philosophy without having put on the slobbering-bib of experience. But if this policy leads also to the scarcity of mutton and beef, the said statesmen will scarcely be regarded with equanimity by the blundering British public who had trusted them. The price of all grain—wheat, barley, and oats—is unnaturally forced down 6s. or 6s. a quarter by the malt tax. This is difference enough to keep much under the plough if the tax were repealed; while if the farmer were allowed to convert his coarser barley into malt for feeding (and malt is the best cattle food in the world), he would no longer be driven by unjust laws to lay down his land to grass, a course fraught with so much evil to the country; and yet at present, in self-defence, there does not seem to be any other course open to him.

NOTTS v. THE LOTHIAN.—WHEEL OR SWING PLOUGHS v. STEAM.

At the Brancote Farmers' Club Mr. T. B. CHARLTON said: Much as I feel the excellence and the importance of farming in the County of Nottingham, and much as I esteem the spirited character of the farmers, at the same time I do think that the farmers of Notts should not think themselves disgraced if they were put on an equality with the farmers of East Lothian. Nor should the farmers of Nottinghamshire feel themselves disgraced or degraded if they were put on a level with or even second to the arable farmers of that the best cultivated part of Scotland. I have seen as good ploughing with the swing plough on strong land there—land which very nearly resembles the red marl of the valley of the Trent, as could possibly be—I have seen as good ploughing in Scotland as in any part of the country. Now, if it is admitted, as I believe it is, that the work done by the wheel plough is more easily done than by the swing plough, if you get two men and set them to work one with a swing and the other with a wheel plough, and they do the work equally well. I think it is a fair argument to use that the swing ploughman is the better of the two. It is admitted that it is more difficult to plough well with the swing than with the wheel plough, and therefore it affords a better proof of the excellence of the men, if they do equally good work. But that was not done here to-day. But what I was going to remark was this, that in the observation made on what I said last year, it was assumed that the use of the swing plough was a retrograding in the work. All I can say is that it is perfectly amazing to me that if that be the case the practice in East Lothian should be what it is, and not only in East Lothian, but throughout the whole of the south of Scotland, a part of the country where farming is carried on to the highest degree of excellence: it is perfectly amazing to me, and I cannot believe that anything like backwardness in farming is going on there, or that the farmers there would use an instrument that would be going backward. It is well known, and if there be any gentleman present connected with the manufacture of farming implements he will bear me out in saying, that whenever any new instrument is introduced it comes first into use in Scotland. When the Government grant for drainage was made some years ago the greatest demand for it was in Scotland, and to this day the greatest purchasers of guano we have are the agriculturists of the southern parts of Scotland. And it may be assumed that where there are men of great intelligence, as the Scotch farmers are, who have steam buildings in every part of the country, and who are always ready to use newest inventions before their neighbours in other parts of the country—this fact, I say, may be assumed as a fair argument for the excellence of their instruments. If the object is to bring out the greatest skill in the man who uses the plough, then I maintain that the man who

ploughs equally well with a swing-plough as another man with a wheel-plough is the better ploughman of the two. If that, however, be but a secondary object, then perhaps it may be admitted that the wheel-plough is the better implement. I admit at once that the use of two wheels with a plough simplifies the operation, and makes it easier to do better and smoother work. Take the case of painters, for instance. An artist paints a picture, and he does it without lines or rules of any kind. It arises from his own idea of drawing, and if he happens to make a beautiful picture it is an affair of great value. But if that picture is put into the hands of a man to engrave it, he uses squares, and lines and other appliances, and he produces it may be a noble work; but it will not be of the same value as the original. So it is also with sculpture. The statue which the sculptor has chiselled out can be reproduced in plaster of Paris, but the excellences of the artist remains with him who formed the original statue. And I may, I think, fairly argue that the use of the swing-plough as contra-distinguished from wheel-plough has this effect, that if we obtain excellent work from them it must be due in some degree to the efficiency and skill of the two men who perform the work. We all remember that one of the reproaches brought against farmers, before the repeal of the corn laws, was that they were people who were working with a crutch, and that they would do better without protection than with it. Now apply that to the matter in hand. The man with the swing-plough works without a crutch, and the man with a wheel-plough works with a crutch. Now, the crutch has been removed from the farmers, and I hope that they do not feel the want of it. I am quite aware that they are not getting high prices for corn; but if it is true that six or seven quarters of wheat are obtained to the acre this year—and I hope it is true—we shall not find ourselves worse off with six or seven quarters at £2 per quarter than we would be with three quarters at £3 per quarter. If we have large crops and lower prices we shall not find ourselves worse off for the want of protection. I cannot say that the statement of the produce is at the rate stated, for I have not yet tested my own crops; but I saw it stated in the papers, and although I do not believe everything that I read in the papers, I hope that if wheat is low other things are not, and that there are some things to fall back upon. I hope that the farmers will be enabled to sail through all their difficulties, and that instead of three quarters of grain we shall be able to produce five or six quarters under the new and improved system of agriculture.

Mr. J. C. NIXON said he believed that societies like the present are too limited to be of any general advantage. He thought that the time had arrived when the simple fact of being enabled to plough well with a pair of horses, whether

with swing ploughs, or with wheel ploughs, which latter were now more generally adopted, would soon be a matter of minor consideration; since the progress of education and instruction seemed likely to lead them to use the same agency which had aided in the growth of towns, and which could not fail to be of equal advantage to the country. It would be probable that the use of swing ploughs or wheel ploughs would be a matter of history, for the agency of steam would take the place of the horse, and a great portion of the land would be cultivated by that cheap and rapid process. He knew that he would be met by the argument that their fields are not adapted for steam cultivation; but he begged to draw their attention to the state of facts twenty years back, and begged to ask them whether the factories of Nottingham were then adapted for the present system of manufactures, or whether the proprietors were then capable of producing in such quantity and such quality as they are now? Certainly not. He might ask them if their fleets of ships which carried their merchandise abroad would have been enabled to export the vast quantities they now did, if it had not been for the adaptation of modern science? Their shipowners and their manufacturers had applied this modern agency, and in doing so they benefited the country to an incalculable extent. He was convinced that the same agency if applied to agriculture would be beneficial to the landlords and to the cultivators of the soil, increasing their annual income to the same or a proportionate extent. It might be a matter of very considerable doubt to the minds of some men who had cultivated the land whether these results would arise; but, if they looked at the matter in a practical way, they would be convinced that there were advantages in adopting the new system rather than keeping on with the present limited system. Mr. Charlton had alluded to the crutch which had been taken away from the British farmer, when they had been left to stand or fall by themselves, and deprived entirely of the assistance of the State. He (Mr. Nixon) thought that if the State would be good enough to extend Free Trade principles to the farmer, and to allow him to sell his produce, or to use it as he liked, it would be much better. If he were a farmer, at this time, when elections were approaching, he would make up his mind not to vote for any man who would not declare himself in favour of the total abolition of the malt duties. He wanted for the British farmer a fair field and no favour. They had given free trade to the merchant and the manufacturer, and enabled them to extend their commerce to all parts of the world; but they had not given free trade to the farmer, although they had taken away the little support that he had, like the wheel of

the plough, or the crutch to which Mr. Charlton had alluded. He repeated that, if he were a farmer, he would not vote for any man who offered himself as a candidate to represent the community in Parliament, unless he pledged himself to vote for the total abolition of the malt tax. He thought that, on the common principles of justice, the farmer who grew his own malt had a perfect right to use his malt as he chose, without the payment of duty. It was an undoubted fact that the amount of farinaceous matter in malt was very great indeed. In all his conversations with his agricultural friends who were great breeders and feeders of stock, he learnt that they placed their greatest dependence on the flesh-producing properties of malt; and if he had a farm, he should like to use his barley and his malt as he liked, without being subjected to Government espionage and taxation. The other point to which he wished to draw their attention was the desirability of extending the usefulness of this society. Let them have a country meeting where not ploughing only, but all other matters, should be brought before the general agricultural public, and that the large landed proprietors should meet their tenants in some large central or manufacturing town, and impart instruction to them and to the community generally that would encourage them to pursue the more enlightened system of cultivation—he meant not ploughing only, not the cultivation of grain or crops merely, but cultivation of stock. He wished the rising generation of farmers to understand not merely how to plough, but also to be able to distinguish a good sheep when they handled one, and to know good cattle when they saw them. He wished the agricultural societies of Nottinghamshire to assemble together in large meetings, such as they held in Lincolnshire, in Derbyshire, and other English counties, where stock and implements are exhibited, and the great landed proprietors were brought together with their tenants, where they discussed matters of general interest, and where, he believed, they conferred and received mutual advantage. He should apologise for taking up so much of their time as he had done; but this was a matter in which he confessed that he felt deeply interested. Every man should take a deep interest in agricultural topics: for he was firmly convinced that upon the progress of agriculture depended the welfare of the whole community. The soil of this country was the foundation of its wealth; and the man who, by the application of improved labour, skill, and capital, grew one sheep or one quarter of corn more than his predecessor, conferred a benefit upon society at large, and set an example that should be a lesson to posterity.

MR. HENLEY, M.P., ON FARMING.

At the Woodstock show, Mr. HENLEY said: The noble duke near me has touched with great force and truth on the benefits which these societies have conferred, and are likely to confer, on the community. He has not said one whit too much on the importance of the agricultural interest of this country, on the concern which every member of the community has in it, and on the vast amount of capital employed in its development. I trust it will always stand among the first, if not the first interest in the country. I believe it is the first interest, if measured by a proper standard. If this conclusion were one at which we ourselves only arrived, it would still be very satisfactory to our feelings; but we have had the advantage of the opinion of a foreign prince who lately presided over the meeting of an agricultural society at a place not very far distant from this. We have a right to consider the opinion a dispassionate one. Self-love may blind us a little; but, no doubt, a distinguished foreigner such as the Duke d'Aumale, residing in this country, is likely to take a just view of things which come before him. His royal highness said very complimentary things of us as farmers and Englishmen. He said that we were better-off from being free from State interference in the management of our farming, and because these societies are self-managed, and have nothing to do with the Government. All these things are

pleasant to hear; but the power that watches over us all fears that we might be too proud; and we have been told in the press that, though better-off than people abroad, we have too many poor, and that, though it is well to have agricultural societies managing themselves, we might have been better-off if we had a Minister of Agriculture; and we are further informed, that the first spring of agriculture followed on free trade, though I can recollect that the first spring of agriculture, as now carried on among us, took place forty or fifty years ago. But all this has appeared in what is called "the leading organ." Now, what are the facts? I do not see many old men here, but there are some here old enough to bear me out in what I am going to say. At the beginning of the present century there was an agricultural society supported by grants from Parliament. Some forty years ago the government of the day got economical, and that society was snuffed out. Well, that society having been snuffed out, the Royal Agricultural Society sprang up. Therefore, it was not for the want of a Government society that we were not better-off. There is another matter which I cannot help referring to. The noble duke says we must progress. I agree with him; but agriculture, in my opinion, has never stood still. You may trace it from one period to another; and improvements in agriculture (great improvements) commenced and

were developed before free trade was introduced. I come to book on that. I think there has been a great improvement in what is called thorough-draining. I believe no one has any doubt of that. The system, contradistinguished from the old Essex system of going across the fall of the land, commenced in this county. I do not go very quick into things; but my tenantry did this thirty years ago. Therefore, that improvement did not originate in free trade. It is quite true that, after the introduction of free trade, 2,000,000*l.* or 3,000,000*l.* of public money were lent to persons to enable them to thorough-drain, but that only gave development to a principle which had been known and acted on before. What is the other great improvement? The quick bringing of stock to market. That is an improvement which has been of vital importance to the people. If it were not for it, they might have wagged their jaws for food, but they would have had no meat to put in them. Sheep (the great staple food of the country) are now brought to market within twelve months after they are born, and when many of them have been shorn once. That began very many years ago in this part of England. I myself remember seeing the young sheep walking to market with flannel jackets on their backs to keep them from getting cold (much laughter). What I am stating is a fact, and it shows how agriculture has gone on, till we now find small lambs going up. You do not get such good mutton to be sure; but, if you had not the supply which is now sent to market, you could not feed the people. Again, the improvement in machinery has gone on step by step, from the rough horse thrashing-machine to those steam implements which we see working at every one of these shows. True, the progress has been gradual; but my hon. friend near me (Mr. Bazley) will not pretend that the mills of Lancashire were as perfect forty years ago as they are now. All modern trade and commerce are constantly improving; and in agriculture there are constant improvements, as well as in trade. We have not gone on by jumps; we have been continually improving, and I am satisfied that

we must still be doing so, in order to keep pace with the necessities of the times. Agricultural shows are useful in enabling us to see how we can best do so. Perhaps you of Woodstock think you are the best fellows in the world; but go one hundred miles, and you will find people who can walk round you. We see that those fellows go faster, and we find out that we must go faster too. We must keep moving. We have been moving, and I believe we shall continue to move. But it may be asked why are not farmers as enthusiastic in favour of new inventions, and as quick to adopt them, as manufacturers are to avail themselves of improvements in machinery? There is this great difference, that, in experiments made with respect to manufactures, the circumstances are of a fixed character, while, in respect of agricultural experiments, the best of them may be upset by atmospherical influences over which you have no control. An experiment which promises very well may turn out to be good for nothing. This naturally makes the agriculturist more careful than if he could at once make his experiments under more settled and favourable circumstances. He must watch the effect of three or four seasons—he cannot jump at such conclusions as if he made his experiments within four walls and under a fixed condition of things. I do not like to see our profession run down as it sometimes is. I do not see why, when this country has brought its agriculture to a point which bears comparison with that of other countries, we should not be allowed to proceed at a fair pace. We cannot increase our ground. That is every day taken from us for houses and villages. Yet, with all these things, we have increased our produce, and this can only have been done by improved modes of working. I do not conclude from this state of things that there is no room for improvement. Quite the contrary. But I think that by the efforts of such societies as this—by watching the effect of inventions, and by adopting such of them as turn out to be real improvements—you will keep the agriculture of the country, as it is now, at the head of the agriculture of the world.

THE PRESENT POSITION OF THE FARMER.

The low price of wheat may well make the agriculturists look round them, to endeavour to discover what prospect there is for them in the future, of obtaining a living profit out of the land, on the present principle of farming. It becomes a question of no small importance whether, with the present relative prices of wheat—as the crop to which the farmer has always looked as the crowning one of his course of husbandry, and of animal produce, the raising of which has been equally considered as a necessary process to ensure the success of the course—it will not be advisable to alter the relative position, and make the animal produce the main business of the farm, and the raising of wheat a secondary consideration. Many agriculturists take this view of the case, and are at least inclining to the opinion that such a step would not at any rate lessen the prospects of the land, and would in all probability increase them. Let us, however, look a little more closely into the matter.

There is no doubt that if the land of England was made the most and the best of, the English farmers would be able to grow wheat at as low a price as those of either continental Europe or America. But to accomplish this, permanent improvements must be made, the most important of which are arterial and thorough draining and subsoiling; and the question then arises, Who is to do these—the landlord or the tenant? It is evident that, under the general system of tenancy, the mere occupier of a farm from year to year, and without a tenant-right agreement, would be mad, to lay out his capital on works of which his landlord might, as soon as they were executed, avail himself by giving him a six months' notice to quit,

and letting the farm at an advanced rent to a fresh tenant. This is no imaginary proceeding, but one of every-day occurrence. Within the last two months we were told of a case in which a respectable farmer, whose lease was on the point of expiring—but who had kept his land in a high state of cultivation, with the full understanding that, at an advanced rent, he would have his renewal—at the last moment found that a young farmer had offered fifteen shillings an acre, or three bushels of wheat, more than his own offer, making the whole rental *seventeen bushels of wheat per acre!* I wish the two fools—landlord and tenant—as much happiness and prosperity from their bargaining as they *deserve*, the one for his injustice, the other for his egregious folly. But to our question.

It is plain that, as a general thing, the landowners either cannot or will not make those permanent improvements that are necessary to fully bring out the productive powers of the soil. It is in vain that the Legislature has passed an act to neutralize the effect of the law of entail, by giving the living proprietor a lien upon the land under the next heir. The large majority cannot or will not avail themselves of the act, and the consequence is, their land is only half-productive, and the tenants are in a normal state of poverty; and with respect to subsoiling, that is wholly a tenant's question, but under the same conditions of tenancy it is equally out of the power of an occupier from year to year to execute such an improvement, when he cannot from one half year to another calculate upon remaining on his farm. We cannot, therefore, hope or expect that the productive powers of the soil will be generally brought out. What may be

done was fully proved by the wheat and barley crops of this year. On those lands that had been drained and subsoiled, the latter whether by the steam or the common plough, such crops were raised as were never before heard of, except in isolated cases, and where similar improvements had been carried out. I have a strong opinion, indeed, that the average produce of the country might be nearly doubled by the adoption of the more important permanent improvements, and that the rental would be increased in a corresponding degree. Whilst, however, the landowners neglect to take advantage of the liberal offers of the act of Parliament, and prefer to have needy tenants and impoverished estates, there is no help for it but to take things as we find them, and make the best of it.

With the certain prospect, then, of a low price of wheat and a high price of animal food in future, one would think that the farmer's interest would lead him to lessen the cultivation of the former and increase that of the latter. Certainly a tenant-at-will would be fully justified in taking such a course, as the most probable one to ensure him a profit. Root crops and pasture land are less expensive to cultivate than wheat; and barley is more likely to maintain its value than any other grain. On the other hand, those farmers who are favoured with leases, and

liberal landlords that will drain the land for them, will find they can produce such crops as will enable them to meet the competition of the foreigner, without making any alteration in their course of husbandry.

There is a great deal of truth and good sense in the letter of Mr. Wray. The farmer's position is not to be envied at the present moment, nor is it likely to improve under the present system of holding. Nothing can improve it but the carrying out by the landlord of those permanent improvements which are essential to render the land fully productive. In the meanwhile, such is the competition for land, that a farm is no sooner announced as likely to be vacant than there are a hundred applications for it, at such rents as it is impossible for the tenant to pay, except out of his capital. The landlord, it is true, is sure of his rent, because he stands in the light of a first claimant creditor. But we question either the wisdom or the honesty of one who will reckon upon this, when he extorts a rent for his land which he knows the tenant cannot pay, and who, moreover, refuses to make those improvements which belong to him, and which are necessary to enable the tenant to discharge honourably *all* his debts, and gain a living besides. N. F.

CALENDAR OF AGRICULTURE.

Plough stubbles for next year's fallows, in fresh weather. Repair old fences, and make new ones. Continue the cutting of drains so long as the weather allows. Mend roads, and cast up earths for making composts. Collect for manure, in every shape or form, all earthy and vegetable substances that can be got.

Flood meadows, and lay dry occasionally.

Cut underwoods; and fill up vacancies by planting and layering. Plant all kinds of forest-trees, especially ash and oak. Keep plantation-fences in good order, to prevent trespassing—a very sure sign of slovenly management.

Raise turnips from the ground, and store the roots in fresh, dry weather. Give the tops to young cattle in the yards, and to the store sheep in the fields.

Early lambs will be dropped during this month, in some places. Feed the ewes very fully, and provide good shelter.

During fresh weather thrash frequently, and litter the yards very often. Collect earths to the compost-heaps, and bring lime for mixing with the earths. Cart stones to the places of draining; and carry fuel, timbers, and faggots.

This being the first month of the winter, the proper arrangements must be made for a systematic management in every department of the winter operations. The live-stock require a most vigilant attention, in being amply and regularly

fed, and in having a dry and comfortable bed in the yards and sheds. Keep the steamer in constant work, and give cooked food daily to the horses, cows, pigs, and poultry. Give the food fresh, and allow not any sourness to happen. Give to the cattle from the store pits; but in fresh weather bring the roots from the fields daily, as required.

The drains and culverts must be all kept in good going order in the farmery, to conduct the urinary liquid to the tank. The cattle in the yards should eat under cover, especially in high, cold latitudes. This purpose may be easily answered by covering the whole area of the farmery with a roof, like the terminus of a railway—an idea seldom expressed, but which may be soon entertained.

The crops of grain, the animals, and all moveable articles, being the property of the farmer, should be insured at his cost; and the buildings at the expense of the proprietor. Policies are very cheaply effected at the special office for farmers, in Norfolk-street, Strand, which does much business, and rises daily into importance and estimation. The proprietor and farmer who neglect the yearly insurance in such an appointment, are most culpably negligent, and commit an act of injustice, not only to themselves, but against the public at large.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

The defences of matting, littery straw, and fern must be ready against frosts, for plants in frames, under glasses, and on warm borders. In this

way late-sown radishes are preserved under straw, which should be raked off in sunny weather.

Little can be added to the directions of last month. All is contingent; and if the weather be

open, there is every probability that it will be wet; and then, to trample in and work ground saturated with moisture, is only to do mischief.

Sea-kale: Pot and excite a second set of plants. Brick-pits and darkened frames, with good linings, would be a great convenience, and prevent much litter.

Earth up celery very high in the ridges.

Asparagus is easily forced upon deep beds of leaves raked from woods and parks, avoiding those of laurels and evergreens generally. The plants should be prepared in proper beds for the

express purpose, and selected from the best two or three-years-old stock. Brick-pits are the best erections; but good frames set upon leaves, with warm linings, will do well.

FLOWER GARDEN.

Cover the ground with half-decayed leaves, or lay cakes of moss among the shrubs, keeping them in order with flint stones; and, in the event of snow, lose no time to brush the evergreens, before the sunshine is hot upon them. Alternate thawings and freezings ruin foliage.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR NOVEMBER.

Although the weather has continued very mild for the time of year, and although rather large quantities of rain have fallen in most parts of England, the advices at hand from the leading agricultural districts are mostly of a favourable character. The young wheats are looking remarkably well, and the land is in good condition for the next crops. Large quantities of wheat have been thrashed out, and, with very few exceptions, the produce is enormous, and of very fine quality. The moderate nature of the imports of foreign produce into the United Kingdom, and the diminished stocks in warehouse, both in London and at the various outports, have produced comparative firmness in the demand for wheat, and an advance in the quotations of from 1s. to 2s. per quarter. At that amount of improvement, rather an extensive business has been passing; nevertheless, millers, almost generally, continue somewhat bare of supply. Apparently, wheat has seen its lowest range; and our impression is that there is ample room for a further rise in the quotations, notwithstanding the great abundance of the present year's growth. There has been a good consumptive inquiry for malting barley, at prices quite equal to the previous month; but grinding and distilling sorts have moved off slowly at about previous rates. Higher quotations have been realized for oats; and the value of both beans and peas has been well supported. The top price of flour in Mark-lane is only 40s. per 280lbs. The trade, however, has been in a healthy state; and our impression is that the currencies are likely to improve, especially as the quantity of flour on passage from New York is very moderate.

The public sales of wool now in progress in the metropolis are going-off freely. Both home and foreign buyers have operated largely, almost every bale of wool brought forward having been disposed of, and prices have advanced 1d. to 2d. per lb. By private contract, English wools command more attention, and the rates have improved quite 1d. per lb. The stocks held in the manufacturing districts are by no means extensive for the time of year. The great activity in the woollen trade is in favour of strong prices for wool for a considerable period.

The great abundance of the potato crop, and the fine quality in which potatoes are coming to hand, have produced considerable inactivity in the demand. At present the quotations are from 50s. to 85s. per ton. Last year, at this time, the rates varied from 60s. to 140s. per ton.

There has been a steady, but by no means active demand for nearly all kinds of hops, and prices have ranged from 100s. to 160s. per cwt. The imports of foreign hops have amounted to about 3,000 bales. Some of them are of full average strength; and a large portion of the supply has passed into consumption.

The root crops have turned out well. Possibly, the weight per acre is not equal to some former years; but the quality of the swedes and mangolds is turning out remarkably good.

The supplies of hay on offer have not been to any extensive, but those of straw have increased. On the whole, the trade has been in a sluggish state. Meadow hay has been selling at from £3 to £4 12s. 6d., clover £4 to £5 10s., and straw £1 6s. to £1 10s. per load. The hay has mostly come forward

in excellent condition, only a small portion of it having shown signs of heat. The last crop was rather limited in quantity; but its quality has seldom been equalled.

On most parts of the Continent, wheat and spring corn, as well as flour, have commanded rather more attention, and the currencies have shown more firmness. The transactions on English account, however, have been on a very moderate scale. In America, the quotations of both wheat and flour are higher than in this country. At New York, large quantities have been taken, chiefly for shipment to the westward, but the demand on English account has been much restricted. However—as gold is at a high premium in America, and as we are still doing a steady business with the States—moderate quantities of produce will, no doubt, continue to reach us as exchange operations. The stocks of grain in stock in the Western States are represented as very large; but the want of labour for agricultural purposes is much complained of.

Letters from Scotland state that fine wheat has been in improved request, and that the quotations have had an upward tendency. The barley trade has been in a healthy state, and oats have commanded rather more money. Other produce has sold to a fair extent, at about previous currencies.

In Ireland, the wheat trade has been far from active; nevertheless, prices have been well supported. Most kinds of spring corn have moved off steadily, and a good business has been passing in Indian corn and flour. The general quality of the new wheats is by no means equal to some former years, and barley and oats appear to have been harvested in very middling condition.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Nearly the whole of the leading markets of consumption have been seasonably well supplied with beasts as to number; but, for the most part, the stock has come to hand in middling condition. Prime beasts have, therefore, commanded a steady sale, at prices fully equal to those current in the previous month. Otherwise, the beef trade, though healthy, has continued inactive, at about previous rates. Some remarkably fine animals have made their appearance from Scotland; but the receipts from Ireland have exhibited no improvement in quality; hence, the latter have been forced off at comparatively low rates. Norfolk has already commenced sending beasts. As yet, however, the number is small; but we understand that the supplies of stock in process of fattening in that county for the London market are unusually large. During the first six months of 1864, steady arrivals from that quarter may therefore be anticipated. We have to notice very little improvement in the condition of the foreign beasts at hand. For the time of year, the supplies have been moderately extensive, notwithstanding that severe losses have been experienced at sea.

Advices from Scotland inform us that most farms are heavily stocked with beasts, and that they have fattened with great rapidity. During the next four or five months therefore, the Metropolitan Market will, no doubt, be well supplied with Scotch cattle in prime condition.

In our own grazing districts there is a full average abundance of really good food. The turnip crop has turned out abundant, and of excellent quality; and the immense yield of oats, barley, and beans is a feature of no ordinary importance. Nevertheless, there is very little prospect of reduced quotations for any description of meat. Pork, from its great abundance, is comparatively low in price, and veal is selling at moderate currencies; but really prime beef and mutton are realizing very high prices—so high, indeed, that the butchers' profits must be greatly curtailed. Consumption is, if anything increasing, and even the very heavy imports from abroad have very little influence upon value.

No serious cases of hoove or lung disease have made their appearance in any quarter; and the health of the stock, generally, has certainly improved. We apprehend, however, that the prevailing wet weather will act prejudicially to the sheep, by increasing the foot rot.

During the past month, the imports of foreign stock into London have been as under:—

	HEAD.
Beasts	11,020
Sheep	30,347
Calves	1,770
Pigs	2,202
Total	45,339

COMPARISON OF IMPORTS.

Nov.	Beasts.	Sheep.	Calves.	Pigs.
1862	6,839	28,577	1,659	633
1861	5,295	27,833	946	1,241
1860	6,961	22,723	1,604	828
1859	5,927	21,907	997	159
1858	4,787	18,258	1,174	156
1857	4,409	17,830	2,687	136
1856	6,102	16,380	1,152	309
1855	7,367	17,094	1,127	454
1854	7,120	16,604	1,108	369

The total supplies of stock exhibited in the Great Metropolitan Cattle Market have been:—

	HEAD.
Beasts	27,704
Cows	506
Sheep	99,130
Calves	2,166
Pigs	3,170

COMPARISON OF SUPPLIES.

Nov.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1862	80,139	532	110,020	2,313	8,172
1861	26,580	560	109,370	1,370	3,430
1860	25,400	500	103,800	2,112	2,920
1859	25,492	522	120,840	1,299	2,800
1858	24,856	534	114,643	1,437	2,970
1857	25,883	506	103,120	3,002	3,087
1856	25,444	515	105,750	2,098	3,415
1855	27,411	457	97,460	1,685	3,535
1854	28,442	512	121,031	1,848	2,726

The district arrivals of beasts thus compare with the two previous years:

	Nov., 1863.	Nov., 1862.	Nov., 1861.
From Lincolnshire, Leicestershire, and Northamptonshire	9,200	14,370	12,000
Other parts of England	2,800	3,450	1,700
Scotland	309	74	428
Ireland	2,800	3,800	3,080

Beef has sold at from 3s. 4d. to 5s., mutton 3s. 8d. to 5s. 8d., veal 3s. 4d. to 4s. 3d., and pork 3s. 4d. to 4s. 6d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	Nov., 1859.	Nov., 1860.
	s. d. s. d.	s. d. s. d.
Beef, ...	3 0 to 5 0	3 6 to 5 0
Mutton	3 2 to 5 2	3 4 to 5 4
Veal	4 0 to 5 4	3 6 to 4 8
Pork	3 6 to 5 0	4 0 to 5 2
	Nov., 1861.	Nov., 1862.
	s. d. s. d.	s. d. s. d.
Beef, ...	3 0 to 5 2	3 4 to 5 0
Mutton	3 2 to 5 8	3 8 to 5 8
Veal	4 2 to 5 4	3 4 to 5 0
Pork	3 10 to 5 0	4 0 to 5 0

Large supplies of meat have been on sale in Newgate and Leadenhall. Owing in some measure to the prevailing mild weather, the demand has been restricted, and prices have had a drooping tendency. Beef has sold at from 2s. 8d. to 4s. 2d., mutton 3s. 6d. to 4s. 6d., veal 3s. 4d. to 4s. 4d., and pork 3s. 4d. to 4s. 4d. per 8lbs., by the carcase.

SOMERSETSHIRE.

We are now in the midst of seedtime, which has been procrastinated by the unusual fall of rain in the last month, being $5\frac{1}{2}$ in.—the greatest for several years. Our low lands have been more extensively inundated than for some time past, and, being rather early in the season, much keep has been destroyed. There is a good deal of water still out, although we have had a very fine week, and much progress has been made in sowing wheat. The barometer is more stationary than it has been all the summer, although the prevailing wind has been south and south-west, from whence we have a large portion of our rainfall: it is now inclined to a point to the east. We had the mercury down to 26 deg. only one night. We are just completing the getting up our potatoes, which would have been a great crop if they had also been good; as it is they have been more abundant than since the disease, and old times are coming round with old prices (6s. to 7s. per 240lbs.). Winter vetches have come up very nicely, as well as the early-sown winter peas. Before this week little was done to wheat-sowing. Wheat (which has been rather freely thrashed) has sold out well as to quantity. During the continued rains it was out of condition, but is better now, and is coming up to the weight reached soon after harvest—62 to 63 lbs., 64 to 65 lbs. extra weight for 'whites. Wheat does not remain in the growers' hands, as our supplies are lessened and the prices firmer. White wheat 5s., 5s. 3d., 5s. 4d. to 5s. 6d. extra heavy weight, 63 to 64 lbs.; red 4s. 9d. to 5s. 2d., 62 to 61 lbs.: the latter Nurseries. Flour has been very low; sales have reached 28s. to 29s. Barley has been very irregular in price and quality, but recently there has been less inquiry for best quality, and lower prices; best malting colour 4s. 6d. to 4s. 9d., other qualities 4s. to 4s. 3d., grinding 5s. 6d. to 5s. 9d. Beans at one time were bought at 4s. 3d. per bush., but with less supply very few can be had under 18s. per coomb; 19s. is now striven for, which buyers will not accede to. Oats 17s. to 18s., 36 to 38 lbs. per bushel. We had a very bad time to get in the clover, and a great deal has grown. The crop was good. We are now taking up the mangel, which, though fine, is not equal to last year's crop, owing to so many failures. With the exception of swedes, which are fine, the turnip crop is a poor one. We have a fair stock of good hay, but the root crop generally is scarcely an average one. Poor cattle have maintained their price. There is more fluctuation amongst the sheep, still the prices are higher than last year. Mutton has sold well (6d., 7d. and 8d. per lb.—high for the time of year), but does not appear to be so plentiful as in some years. Beef finds ready buyers, and very little which is driven to the fairs and markets is taken home again. As far as can be ascertained, there does not appear to be the usual number of extra fat cattle for Christmas as have frequently been in store. Although the price of corn is low, it does not seem to have been so much used as when at such low prices, for cattle; as beef, at 10s. 6d. to 11s., and extra 12s. per 20lbs., would, from appearance, show some profit in its use; but the price paid for poor stock must lessen the profits of the graziers. Our sheep flock has not been very healthy, owing to so much wet; and there appears to be just grounds for doubting the soundness in some districts. Apples are mostly got in, but scarcely half a crop. Where there has been no stock the grass, up to this time, has been growing, which has saved the hay. The straw is good, and cattle will be likely to do well during the winter.—11th mo., 20th.

AGRICULTURAL INTELLIGENCE,
FAIRS, &c.

ALYTH FAIR.—Good wedders sold from 26s. to 30s. each, and ewes 16s. to 20s. Mutton sold at an average of 7d. per lb. The cattle were not so numerous as on last year's Martinmas market, but fully as good in quality. The following are samples of the day's transactions: Mr. Fenton,

of Fauldend, sold three fat beasts at £30 per head; Mr. Fall, of Welton, Blairgowrie, sold to Mr. Ruthven, Dundee, six fat stots at £14 per head; ten to Mr. Playfair, Banchoory, at £8 10s.; fifteen to J. and J. Nicoll, Forfar, at £7; six bulls, two years old, to the same party, at £13 10s.; and two fat cows to Mr. Ogilvy, Arbroath, at £24 the pair. Mr. Ruthven bought a lot of fat cattle from Mr. Peebles, Blairgowrie, at about £17 per head; and another lot of two fat queys from another gentleman at £14 10s. Mr. Crawford, Perth, bought a lot of four fat cattle from Mr. Kidd, Easter Craig, at 9s. 6d. per Dutch stone; and also a lot of stots from Mr. Fenton, Fauldend, Lintrathen, at £20 per head. Mr. Henderson, Derry, Kilry, sold a fat quey at £12.

ANDOVER FAIR.—The supply of sheep was very short, and the best descriptions sold readily, at an advance of from 4s. to 5s. per head over the late fair at Weyhill.

BAKEWELL FAIR.—The quantity of cattle was very considerable for a winter fair, and a large amount of business was done, milkers being in especial request. The show of sheep moderate, few stores being offered. A large number of horses were shown, but the sale appeared slow. The following are the minimum and maximum prices realised: In-calf and newly-calved cows, from £14 10s. to £17; heifers, £11 to £13 10s.; storks, £6 to £8 10s.; yearling calves, £3 to £5; barren cows, £10 to £13. Fat beasts 7s. to 6s. 6d. per stone; fat wethers, 7½d.; fat ewes, 6d. to 7d. per lb. Store lambs, 28s. to 34s.; large pigs, 30s. to 55s. each; small do., 12s. to 25s.

BANBURY FAIR.—The supplies both in beasts and sheep were about the average, whether as regards quantity or quality of stock, for the season. Good things were dear, and of really fat beef or mutton there was very little. Beef fetched from 3s. 6d. to 4s. 8d., and mutton from 4s. to 5s. the 8lbs.

BEDFORD FAIR.—There was a large supply of beasts good quality, which moved off quickly at full prices. Stores fetched from £15 to £17, and were cleared off. The supply of sheep was scanty, and high prices were realised.

BISHOP'S CASTLE FAIR.—There was rather more fat than store stock, and better prices than at the last fair were realised. A good many pigs were offered, small stores selling well.

BRECON.—There was an average supply of cattle: fat stock met with a dull sale, but lean stock sold readily, fetching good prices. There were but a few sheep penned, but the supply of cart-horses was large.

CAMELFORD FAIR was well supplied with all kinds of farm stock, which met a very fair sale. Young steers and cows and calves sold at somewhat of an advance of prices on the late fairs in the district, as did also good breeding ewes.

CASTLETON FAIR.—The show of cattle and sheep was large, and a fair amount of trade was transacted, at about late rates, and in some instances a slight advance was obtained. Milch cows £13 to £17 10s., barren £9 to £14, and cows down calving and in-calf £12 to £16, heifers £10 to £15, storks £5 10s. to £8 6s., yearling calves £2 10s. to £5 5s., fat beasts 7s. to 7s. 9d. per 14lbs. A good supply of store pigs, which found ready buyers at 30s. to 34s. Small pigs 12s. to 24s.

CAWDOR FAIR.—The turn-out of cattle was not equal to the former market, and the demand was not brisk; but those who sold realised prices equal to the former markets of the season. Mr. Wm. Smith, Easter Glackton, sold 2 Highland storks at £11 10s. the pair; Mr. Bannerman, Campbelltown, sold a polled milk cow at £8 5s.; Mr. Anderson, Blairnath, sold a lot of Highland storks at £5 5s.; Mr. John McDonald, Rintober, sold a cross stork at £6 6s., and a lot of Highland queys at £8 12s.; Mr. Kerr, Galcantry, bought four heifer crosses at £6 10s.; Mr. Joss, Budgate, sold to Mr. M'Kintosh, flesher, Nairn, a cow, at £20.

CREWE FAIR.—There was an unusually large show of cattle. Pigs were also in good supply, but sheep were not numerous. Trade was not very brisk, and prices were in favour of purchasers.

DONCASTER FAIR.—The show of lean stock, in which the chief interest of the fair was centred, was more than an average, and at the opening of the fair the demand for cattle was very brisk, and higher prices were realised; but afterwards a slight fall in value was experienced, and some lots remained unsold. Generally, the show of cattle was not of the best quality, there being a marked paucity of good strong beasts. Only a few milch cows, which commanded high prices, ranging from £15 to £20, and even as far as £25. Two years

old steers fetched from £10 to £13 each, and yearling steers from £7 to £9. Drapes made from £11 to £14 each. There was only a very small show of sheep, in which the trade ruled dull; wethers sold at from 42s. to 50s. each, and lambs 26s. to 36s. The show of horses was far from good, both in point of number of animals shown and their quality; being generally of an inferior character, there was scarcely any demand, and business was difficult to transact at low prices. Inferior cart horses made from £15 to £20; harness horses, from £12 to £16 each.

DUNFERMLINE FAIR.—A brisk sale at high prices, good fat bringing from 9s. to 10s. per Dutch stone. The following are a few of the lots sold:—Mr. Hill, Leckertown, sold ten stots at £9 10s. each, to Mr. Lucas, Bridge of Allan; Mr. Erskine Beveridge, Brucefield, sold a very fine cow, much admired, for £27 8s. to Mr. Sanddon, flesher, Alloa; Mr. Henderson Hill sold a lot of queys at £8 5s. each, to Mr. Paterson, Balmole, near Burntisland; Mr. John Black sold a lot of Highland cattle, the property of Mr. Dalgleish, Ardnarnurdoch, at £8 13s. 6d. each, to Mr. Beveridge, farmer, near Kinghorn; Mr. Inglis, Lochgelly, sold a lot of queys to Mr. Drummond, Bushes, at £9 1s. each. Several other lots exchanged hands at prices varying from £7 to £12 each. There were very few milch cows in the market. At the horse market there was a full average supply of animals, and prices were from £10 to £25 each.

DUNSE FAIR.—The cattle exhibited here were chiefly two-year-olds and storks, and prices ran for the former from £10 to £14, and for the latter from £5 to £11. Mr. Simson bought two-year-olds at £12. Another lot of the same description were sold at £10 15s. Mr. Ruddick, dealer, Berwick, sold a large number of cattle at prices ranging from £6 to £11. Mr. Wellbank, dealer, Berwick, sold a lot of storks at £8. Another lot was purchased by a farmer at £8 10s.; and a fine lot of storks brought £11 15s. In the sheep market, fat sold well, and the prices realised were reckoned about 8d. per lb. One lot of fat Cheviot sheep from Langton Home Farm brought 48s. per head. Another lot of fat sheep brought 46s. There was a decided scarcity of fat sheep. The lean beasts of this class did not sell well. In the cow market little business was done. In the horse market the show was large. The sale among these animals was anything but brisk, and prices were considerably down. Three-year-olds from £18 to £23, while West Highland ponies were from £5 to £7. Mr. Campbell, dealer, Berwick, sold pony horses from £15 to £25, and draught horses from £25 to £38.

ELGIN MONTHLY MARKET.—There was a thin attendance, and no great show of stock. Beasts for feeding were in demand, and several transactions in this class of stock were effected. Very little fat was shown. We annex a few of the sales: Mr. Falconer, Ardivot, sold a lot of two-year-olds at £10 17s. 6d.; Mr. M'Lean, Scottonhill, sold a lot of one-year-olds at 11 guineas; Mr. Mustard, Drainie, sold a lot of one-year-olds at £9 10s.; Mr. Cruickshank, Rosehaugh, sold a pair of yearlings at £21 the pair; Mr. Watson, Unthank, sold a lot of yearlings at £9; Mr. John Douglas, Castlehill, sold a lot at £11 10s.; Mr. John Shand, Skelnie, sold a pair of yearlings at £12 10s.

GLASTONBURY MONTHLY MARKET was well supplied with cattle, sheep, and pigs. There was a large attendance of buyers, and a good business was done at remunerating prices.

GLOUCESTER MONTHLY MARKET.—There was an average supply of beef, the quality of which was rather inferior; but the best descriptions met with a brisk trade. The number of sheep on offer was limited, and good wethers sold readily at former prices. The trade was brisk, and nearly the whole were disposed of at the following prices: Beef 6½d. to 7d., mutton 7½d. to 8d. per lb.; pigs 9s. to 9s. 3d. per score.

HAYWARDS HEATH FAIR.—This is principally a pig fair, and there was a very good display, from the eight-weeks old suckling to the 60-stoner, but business was dull, the prices of young pigs and shuts being from 4s. to 5s. less than last year, suckling realising from 12s. to 13s. 6d. per head, according to age and size. Young shuts fetched from 18s. to 20s., and older ones in proportion. Fat pigs, from 20 to 25 stone, sold for 3s. 8d. to 4s. per stone, but larger ones, even the very best, only reached about 3s. 6d. There was a very fair show of horses, but business was exceedingly slack, and only a few old cows of a very mean appearance were offered, but there were very few buyers in that line.

HORSHAM FAIR.—About the usual number of beasts. The Devons were in finer condition than we have ever seen them here before, and almost all of them were sold at a long price. We did not hear of any lot making over £16 per head. The Welsh beast were upon the whole considerably smaller, and not nearly in such good condition, neither were there so many of them as there were of the Devons. We believe there were but very few beasts unsold.

KINGSTON-ON-THAMES FAIR.—There was an average supply of stock, but the sale was not brisk. Sheep were not so numerous as in former years.

LAUNCESTON FAIR.—This being one of the principal fairs in the neighbourhood, much interest is taken in it, consequently a large number of business men meet on the occasion. The supply of cattle was by no means large, and with the exception of the Christmas beef, did not come up in quantity or quality to former years. The sale was good; ordinary beef £3 per cwt.; and fat sheep 7d. per lb. Store cattle found buyers at former rates; and on the whole it was a very good selling fair.

LOSTWITHIEL FAIR.—The supply of cattle was moderate, and there were but few buyers. Fat bullocks sold at 63s. per cwt., wether sheep 7d. per lb., cows 6½d.

LOUGHBOROUGH FAIR was larger than for some twenty years past. The supply of fat were not excessive, consequently all sold at high figures. Of steers, &c., there was an extraordinary supply, but as the demand was in the ratio, prices were considerably in advance. The horse fair contained some good animals; but, as usual, there was a preponderance of bare bones and sinews. A goodly number changed hands at good figures.

LUDLOW FAIR.—The attendance was not so large as usual. There was a tolerable supply of fat cows, which realized about 6½d. per lb. Sheep were anything but plentiful; fat wethers fetched about 7½d. per lb. There were but few good waggon horses, and those which changed hands produced fair prices.

MALTON FAIR was well attended, farmers generally being purchasers rather than sellers, and the quantity of stock shown was quite an average. Prices were rather lower than at Michaelmas. The English cattle were a small show. The best shorthorned steers were worth £15 to £20, heifers £14 to £16 per head. Scots were very few, and sold well from £10 upwards per head. The large proportion of stock in the fair were Irish droves, of which the most promising steers realized from £10 to £13, heifers from £8 to £10. There was a large number of leaner beasts, varying from £5 to £8 per head. The market for healthy ia-caving English cows was remarkably good, strong prices being obtained. Lean sheep were hardly represented, and prices were good. Fat stock is very firm. Beasts for Christmas beef are worth from 8s. 6d. to 9s. per stone, ordinary beef 7s.; mutton sheep 7d. to 8d. per lb.; porkers 6s. 6d. per stone. The pig market was active.

MAYFIELD FAIR.—The supply of good stock was short, and other sorts rather less than usual. The good steers realized from 20s. to 31s. per head more than at Rotherfield, and even the inferior sorts could not be obtained without an advance. Prices, good steers from £14 to £16, good barrens fetched high prices from 8s. 3d. to 8s. 9d. per stone when fat. The supply of horses was large, and prices low.

MILBORNE PORT FAIR.—The cattle, sheep, and

pigs were sold at good prices, and a considerable amount of money, as compared with the business of recent years, changed hands.

NEWTON-STEWART FAIR.—Cattle were principally young Galloways, with a sprinkling of Ayrshire and Irish. The quality of the stock was deficient from that of last market, but prices in proportion were equally good, and a good many lots changed owners during the day. Three-year-olds ranged from £10 to £13 each, two-year-olds £8 to £10 10s., and stirks and cudauchs £4 to £6 10s. Of horses the show was more numerous than usual. The highest figure we could hear of being obtained was £38. Mr. Clark of Mearns purchased thirteen, the best animals on the ground, at prices ranging from the above figure down to £30. Secondary class ranged from £15 up to £25, but very few reached the latter sum. Of pigs very few in the market; prices from 12s. to 14s. each.

RUGBY FAIR.—The business in horses has been very brisk. On Monday the sales were principally in stables, where a great many horses of high character—hunters, chargers, &c.—were sold at very remunerative prices. On Tuesday and Wednesday there was a large supply of horses of all kinds, of a stamp better perhaps than usual. For these high prices were readily obtained. Several large droves of Irish horses met with a ready sale, at prices ranging from 15 to 40 guineas. The supply of good useful nags, cobs, and ponies was large, but not larger than the demand. There was a large supply of horses and colts suitable for agricultural purposes; but for these the demand was not so good, and prices were accordingly lower than in former years. By Thursday evening a good clearance of most of the useful animals was effected.

SOMERTON FAIR.—The supply of cattle was very small; and scarcely any business was done.

TRURO FAIR.—The supply of both bullocks and sheep was rather small—probably about 300 bullocks, and from 800 to 900 sheep. Fat beasts sold at from 60s. to 63s., store cattle at from 42s. to 45s. per cwt., and sheep at from 6½d. to 7d. per lb. The demand for both bullocks and sheep was brisk; and nearly all that were on offer were disposed of.

WELSHPOOL FAIR.—The supply of sheep was good. Mutton about the same as last fair. The show of pigs was large, and sold at low prices. The exhibition of cattle was very large, Beef averaging from 7d. to 7½d. per lb. The show of horses was not good, and dealers scarce; consequently, they sold low.

WIRKSWORTH FAIR.—The supply of cattle was rather large, the best being bought up at fair prices, and a considerable number remaining unsold.

YEOVIL FAIR was well attended and supplied. Sheep (good) sold remarkably well, but cow stock was dull.

YORK SOULMAS FAIR.—There was a very limited show of Shorthorned steers, compared with what had previously been exhibited at this market. A small number of in-calvers and droves had ready demand. Irish beasts were exceedingly numerous, and they had steady sale, at late prices. We had a limited show of horses, of only moderate quality. Animals fit for harness or the saddle had good demand. A poor show of good draught-horses. On the whole the market was a bad one.

THE METEOROLOGY OF NOVEMBER.

The 28th and 29th of October, with which we commence our meteorological summary, were warm, damp, cloudy days; and their mean daily excess of temperature amounted to 1½°. A S.W. wind prevailed on both days, blowing on the 29th with a force of 11 lbs. on the square foot. The barometer decreased during both days, and slightly increased to 29.32 inches by 6h. a.m. on the 30th; it then commenced to fall slowly after that time, reaching

29.30 inches by 8h. a.m.; the decrease became more rapid as the day advanced: by 1 h. p.m. it read 29.05 inches, at 2h. 28.96 inches, and by 3h. 30m. p.m. the minimum reading was reached of 28.80 inches; after which it increased, at first with even greater rapidity than it had declined, reaching 28.85 inches only 9 minutes after the minimum value, 29.00 inches by 4h. 20m. p.m., 29.07 inches by 5h. p.m., and finally to 29.30 inches by 11h. p.m.

During this curious depression of the mercurial column, the wind blew with great but variable force; commenced blowing strongly about 8h. a.m., with the first indications of decided barometric fall, but did not exceed a force of 3 lbs. till 9½ h. a.m.: at this time a gust was experienced of 15 lbs., accompanied by a heavy squall of rain for a few minutes, and which caused a decline of temperature of 2°. From 9h. 35m. a.m. to 3h. 10m. p.m. the pressure generally varied between 1 lb. and 5 lbs.; the wind then greatly increased in vigour, pressed with a force of 12 lbs. on the square foot at 3h. 20m. p.m., 13 lbs. at 3h. 23m. p.m., 17 lbs. at 3h. 29. p.m., and to the enormous amount of 29½ lbs. at 3h. 30m. p.m.; it then suddenly decreased in amount, varying between 6 lbs. and 9 lbs. from 3h. 35m. p.m. to 4h. 15m. p.m., then gradually died away, seldom pressing after this with a greater force than 2 lbs. or 3 lbs. It may have become apparent to readers of the preceding remarks, that the time of the greatest gust, viz., 3h. 30m. p.m. was also the time of the greatest barometric depression. Nor was this all; for at that time the temperature was declining rapidly (from 53½° at 3½h. p.m. to 46° by 4h. p.m., and to 43° by 5h. p.m.), and at the same moment the direction of the wind changed from S.S.W. to W.N.W. The rain which fell during these frequent squalls amounted to 0.32 inch.

The depression of temperature which attended the great gust caused the mean for the day to fall below its average value to the amount of nearly 1°; and the cold period, thus commenced, continued during the following four days, or till the 3rd of November, the various departures from average values being 1½° on the 31st October, 3½° on the 1st November, 1½° on the 2nd, and ½° on the 3d, the wind still continuing to blow from the S.W., with forces which occasionally reached 6 lbs., 9 lbs., and 10 lbs.

The barometer, which had reached 29.44 inches on the 31st of October, again declined with extraordinary rapidity to the reading 28.74 inches on the morning of the 2nd of November, then increased with still greater rapidity to 29.71 inches by the next day (the 3rd), declined by a small amount by night on the same day, and then rose uninterruptedly to a maximum value of 30.36 inches by the 6th; thus giving a range of atmospheric pressure of 1.6 inch within four days—an almost incredible amount. The great rise in the barometer ushered in warmer weather, and the mean temperatures of the 4th and 5th days were in excess of the average values by the large amounts of 10° and 8½°, the wind still blowing with tolerable force from the S.W.; but on the following day, with the maximum reading of the barometer, the wind changed to N.E., and the temperature became colder, the mean for the day exhibiting a deficiency, as compared with its average value, of 5½°. Another change took place on the two following days to damp warm weather, the mean temperature values exceeding their averages by 2½° and 3½°, the wind again blowing from the S.W., and the barometer meanwhile decreasing to 29.57 inches by the 8th. From the 9th to the 13th a

cold but fine period prevailed, the mean daily temperature values falling below the average quantities to the mean amount of 5°; and the lowest points to which the thermometer fell were 28° on the 10th, and 29½° on the 12th and 13th; whilst the thermometer showing the lowest temperature on the grass fell to 30° on the 8th and 9th, 28° on the 10th, 26½° on the 11th, and 23° on the 12th and 13th. From the 14th to the 19th the barometer generally differed but little from 30 inches, and a generally cloudy and warm period prevailed, with very insignificant temperature changes. Thus, the range of temperature for the 14th, 17th, and 18th days scarcely exceeded 5°, and only slightly exceeded that amount on the remaining days of the period. During this period a S.W. wind constantly prevailed, and the mean daily values for temperature exceeded their average values by 8° on the 16th and 17th, 6° on the 15th and 18th, 5° on the 19th, and 4½° on the 14th. On the 20th and 21st days the barometer declined generally, with great rapidity on the latter day; falling to 29.41 inches by 5 h. p.m., at which time a violent squall of wind and rain occurred (of precisely similar character to that of October 30th), during which a pressure was experienced of 17½ lbs. on the square foot, and caused the temperature to fall immediately to the extent of 8°. Rain fell during this squall to the amount of 0.13 inch. From this day to the 26th the weather continued warm, and with the exception of the 24th generally fine, although cloudy; and the mean daily temperatures of all these days exceeded their average values by extremely large amounts; on the 25th by 12°, 24th by 11°, 26th by 8°, and on the 21st and 23rd by about 7°. The barometer continued high throughout this period, and rose finally to 30.2 inches by the 26th.

Casting a glance over the accompanying tables, we find that the highest barometer reading occurred on the 6th, and was 30.36 inches; the lowest was 28.74 inches, on the 2nd; giving a range for the month of 1.62 inches. The highest temperature in the shade was 60.8° on the 4th, and the lowest 28.1° on the 10th, making a range of 32.7°. The highest reading in the rays of the sun was 81° on the 20th, the lowest on the grass was 23° on the 12th and 13th. The dampest day in the month was the 7th, and the driest day was the 31st of October. The total amount of rain collected, from the 28th of October to the 26th of November, was 2.04 inches—an amount somewhat exceeding the average quantity. The number of days on which rain fell amounted to 14—a number rather in excess of the average value. The past month, therefore, has been chiefly remarkable for its generally-high temperature, accompanied throughout by S.W. wind. Such a state of things cannot long continue; and I think we may confidently count upon a speedy change to colder and more seasonable weather—to weather, perhaps, of extreme severity, such as in previous years has generally been experienced after long-continued warm weather at the commencement of the winter period.

METEOROLOGICAL ELEMENTS FOR THE NEIGHBOURHOOD OF LONDON;

FROM OCTOBER 28TH, TO NOVEMBER 26TH, 1863.

Month and Day.	Temperature of the Air in Shade.			Highest Reading of a Thermometer in the full Rays of the Sun.	Temperature of Vegetation.*	Degree of Humidity. (Saturation=100).	Amount of Cloud, 0 to 10.	Amount of Rain.	General Direction of the Wind.	Weather Remarks.
	Highest	Lowest	Mean.							
1863.	°	°	°	°	°			Inches.		
Oct. 28	56.2	43.8	48.9	72.7	42.0	91	9.5	0.03	s.w.	Cloudy day; a little rain
29	54.2	43.7	47.8	66.8	38.2	90	9.5	0.12	s.w.	Cloudy; rainy afternoon
30	54.0	39.7	45.7	55.0	36.2	94	8.0	0.32	s.w.	Overcast; squalls and rain
31	52.6	38.4	44.8	79.0	30.0	71	2.0	0.00	s.w.	Cloudy; lightning at night
Nov. 1	49.5	38.5	42.6	78.0	29.7	79	6.7	0.01	s.w.	Fine morning; a little rain
2	50.0	40.9	44.8	74.8	37.0	78	9.8	0.59	s.w., N.W.	Cloudy; frequent rain
3	53.3	37.5	45.7	55.0	26.4	92	10.0	0.02	s.w.	Generally cloudy; rain
4	60.8	51.7	56.0	72.0	45.4	83	10.0	0.02	s.w.	Generally overcast
5	56.8	52.2	54.2	58.6	48.8	89	10.0	0.09	w. s.w.	Cloudy; rain, at times heavy
6	48.5	34.3	40.3	80.4	30.4	86	1.5	0.04	N.E.	Fine; fog at night
7	53.0	40.0	47.5	53.1	28.0	100	10.0	0.09	s.w., w.	Overcast; rain
8	53.3	44.7	48.3	56.0	29.8	99	10.0	0.25	s.w., N.W.	Overcast; rain generally
9	49.6	34.4	41.3	79.7	29.7	79	2.0	0.00	N.E.	Fine, few clouds
10	45.0	28.1	37.7	49.0	28.0	98	6.8	0.08	w. N.W.	Cloudy; rain in morn.
11	44.5	32.6	38.1	47.2	26.5	93	7.5	0.00	N.E., N.W.	Cloudy; even cl.; hoar frost
12	43.4	29.7	37.4	64.4	23.0	90	0.5	0.00	s.w., N.	Cloudless; hoar frost
13	48.0	29.7	40.6	77.0	23.0	89	7.5	0.00	s.w.	Cloudy; hoar frost
14	50.2	44.6	47.7	52.2	35.0	90	10.0	0.00	s.w.	Overcast
15	53.0	45.1	49.0	57.2	37.2	82	10.0	0.00	s.w.	Overcast
16	55.0	45.4	50.6	60.0	40.6	95	7.5	0.00	s.w.	Overcast till night; clear
17	53.8	47.3	50.2	59.2	42.5	82	10.0	0.00	s.w.	Overcast
18	51.3	46.0	48.3	59.0	40.5	83	9.8	0.00	s.s.w.	Generally overcast
19	53.6	43.1	47.3	78.0	36.0	83	9.0	0.00	s.s.w.	Generally cloudy
20	53.0	39.4	45.7	81.0	30.2	90	3.3	0.00	s.s.w.	Partially cloudy; fine
21	56.2	41.4	49.3	58.9	30.1	87	5.5	0.13	s., s.w.	Cloud var.; squall 5.10 p.m.
22	50.8	41.5	46.5	77.7	34.0	79	2.3	0.00	ws.w., sw	Fine clear morning; cloudy
23	53.6	42.7	48.3	77.0	30.9	87	7.0	0.00	s.w.	Cloudy after noon
24	55.5	47.6	52.1	62.0	42.0	98	10.0	0.25	s.s.w.	Overcast; rain in morning
25	57.0	49.2	52.8	67.1	41.5	89	7.0	0.00	s.w.	Partially cloudy; fine
26	51.7	45.9	48.9	55.5	38.0	97	10.0	0.00	s.	Overcast

* The "temperature of vegetation" is that obtained from a self-registering thermometer placed on the grass at night. It is therefore a minimum reading for the previous twenty-four hours.

TABLE SHOWING THE PRINCIPAL FLUCTUATIONS IN THE ATMOSPHERIC WAVE, FROM OCTOBER 28TH TO NOVEMBER 26TH, 1863.

1863. Month, Day, and Hour.	Reading of Barometer.*		1863. Month, Day, and Hour.	Reading of Barometer.*	
	Highest.	Lowest.		Highest.	Lowest.
	Inches.	Inches.		Inches.	Inches.
Oct. 29, 3 p.m. ..		29.10	Nov. 11, noon ..		29.19
„ 30, 6 a.m. ..	29.32		„ 13, 9 p.m. ..	30.14	
„ 30, 3½ p.m. ..		28.80	„ 16, 3 p.m. ..		30.00
Nov. 1, 9 a.m. ..	29.44		„ 18, 9 a.m. ..	30.11	
„ 2, 6 a.m. ..		28.74	„ 18, 9 p.m. ..		29.98
„ 3, 9 a.m. ..	29.71		„ 19, 9 a.m. ..	30.08	
„ 3, 9 p.m. ..		29.56	„ 21, 5 p.m. ..		29.41
„ 6, noon ..	30.36		„ 23, 3 p.m. ..	30.01	
„ 8, noon ..		29.57	„ 24, noon ..		29.71
„ 9, 3 p.m. ..	30.08		„ 26, 9 p.m. ..	30.23	

* All the readings are reduced to the constant temperature of 32 degs.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The first fortnight of the past month was unusually stormy and wet, and field work was greatly impeded; then came mild weather, with light fogs and occasional sunshine, and, finally, the temperature was raised, and some quantity of rain fell through the country. The roughness of the autumn was very unfavourable to the completion of harvest in the backward districts of Ireland and Scotland, in some degree affecting the general estimate of the cereal yield, and almost inflicting ruin on certain localities, while the wet delayed the digging of the late potatoes, and set up much more disease than had been anticipated. Those who were forward with field work and wheat planting are now gratified by the appearance of their lands, the young wheat looking very healthy and promising, while the later sown has every chance of making head against the inclemencies of a severer time. As respects prices, they have remained nominally the same, and as this state of things obtained last month, there has been sufficient time for the general averages to represent the present state of the markets, which is seen in the weekly variations of only 2d. per qr., say alternately from 40s. to 39s. 10d.—a price reached at the close of March 1859; but in two months from that date they rose to 54s. 4d. There are several indications also of amendment now: for the last fortnight prices have generally hardened, as respects English samples, while foreign, from the great falling off in arrivals, has risen from 2s. to 4s. per qr. The London receipts are not one-fourth of what they were last year, the general imports having also continued to decline, while all continental markets have been gradually rising, and in New York a speculative spirit has sprung up, just at the period when navigation is about closing. The receipts, too, at Montreal for the present season, as compared with 1862, show a deficiency of 370,000 qrs., and there is universal complaint in the whole of the western provinces of the unremunerative character of prices. When Christmas therefore, with its liabilities, has passed, there is ample room for an advance; and should the present darkness of the political horizon break out into the blaze of an European war, there would be no question as to the result.

The following prices were recently current at the several places hereunder named. Rates at Paris ranged from 38s. to 43s., old Baltic wheat at Antwerp brought 45s., American winter 43s. to 44s., and Ghirka 40s.; the best Polish at Amsterdam was worth 50s. per qr., American 43s.; Saale wheat at Hambro' 44s., Holstein quality 39s.; at Danzig, after some dulness, there was a revival, and fine high-mixed old qualities were worth 51s. (freight included to London), new to 49s.; at Porrentruy, in Switzerland, 45s. was made for good samples: at Straubing, in Bavaria, 43s.;

Cologne quoted 41s. for the best quality; native wheat at Galatz was 24s. to 30s., Ghirka to 33s.; wheat in Egypt 27s. 6d. to 28s. 6d. (used here for distillation); native wheat at Venice 46s.; prices, with a good demand at Genoa, were rising—Berdianski to 50s. 6d., Sardinian 49s. 6d., Galatz 41s. 6d.; soft wheat at Algiers brought 42s. 6d., hard 34s. per qr.; Chicago wheat at Montreal was quoted 29s. 3d., Milwaukee 29s. 11d., Ohio 31s. 7d.; at Chicago itself wheat was quoted 24s. 8d.; incessant fluctuations still prevailed at New York, the last quotation for spring red being 33s. 3d., amber to 36s. 6d. per qr., white to 41s. per qr. of 480lbs.

The first Monday in London commenced on a moderate English supply of wheat, and a good foreign arrival. The show of samples during the morning from Essex and Kent was short; the trade was quiet, but there was a preference for fine white qualities, which were placed steadily at the previous quotations; inferior sorts and red went off with great difficulty. Fine old foreign experienced a retail demand at fully the previous quotations, and cargoes afloat sold freely at some improvement in values. The weather having been unfavourable to thrashing, much of the wheat in the country was in poor condition, and difficult to sell, as at Bury St. Edmund's and some other places; but generally, where the samples came well to hand, prices somewhat hardened, as at Hull, Spalding, Birmingham, Newbury, Bristol, and Gloucester; while at a few places some advance was noted: Leeds was 1s. per qr. dearer. Liverpool was firm both on Tuesday and Friday. So were the Scotch markets, especially for good foreign, Glasgow being 3d. to 6d. per boll higher for American red. With very bad weather in Ireland, all good corn was fully as dear. The second Monday was less provided with home-grown wheat, and the foreign supply was very small. The show from Kent and Essex was moderate, and more confidence was generally evinced in the trade, white qualities being still most in request at quite as much money, and for picked parcels occasionally rather more was paid; transactions in foreign were also more numerous and extensive, the best Danzig and Ghirka sorts being rather dearer; floating cargoes continued a free sale at full prices. Though the atmosphere was clearing, hardly enough time had elapsed to make much improvement in the condition of the samples offered at country markets, but the feeling generally was more decidedly firm, with a slight advance paid here and there. Liverpool was again firmer at both the markets. At Edinburgh and Glasgow fully the former currency was paid. The Dublin and Cork markets were steady, and Limerick rather dearer for wheat. On the third Monday there was a better English sup-

ply, and a good arrival from abroad. The show of samples this morning from Kent was fair, but there was little offering from Essex, and as most of the country markets evinced an upward feeling, factors at first demanded fully 1s. per qr. advance, but as the market wore it was found impracticable to realize any improvement, and millers' offers of the previous rates were accepted. Increased firmness was, however, shown on the part of holders of foreign, and in many instances an advance of fully 1s. per qr. was paid for choice lots; cargoes afloat were not numerous, and former rates were made easily. A second week of improved weather exhibited its beneficial effects at many places in the improvement of samples, and more cheerfulness prevailed, as well as confidence in trade. The country markets, with scarcely any exception, all described prices as slightly in favour of sellers, though Newark and Newcastle were dull; Bristol and Gloucester both advanced 1s. per qr. Liverpool was 1d. to 2d. per cental dealer on Tuesday, and firm on the Friday following. Edinburgh was the turn dearer, and Glasgow again noted a rise in good foreign samples of 3d. to 6d. per boll. At Dublin foreign wheat was up 1s. per barrel.

The fourth Monday opened on moderate English and very small foreign arrivals, chiefly from America. The show of samples from Kent and Essex was but scanty, and the condition mostly inferior. Factors at first asked 1s. per qr. advance, but only succeeded in obtaining the rates of the previous week, at which the bulk was nearly all cleared. The price of foreign, which had hardened all through the previous week, was raised fully 1s. per qr. for all descriptions, more especially on middling Russian sorts. Cargoes afloat went off well at the same improvement, but few being for sale. The country markets during the week were rather firm, and 1s. per qr. dearer. The London trade of Friday was of the same character.

The imports into London for the four weeks were, in English growth 23,770 qrs., in foreign 57,295 qrs., against 21,386 qrs. English, 253,159 qrs. foreign, for the same time last year, showing that the foreign arrivals were not one-fourth what they were at that period. The entire imports for the kingdom in four weeks were 425,918 qrs. wheat, 355,330 cwt. flour. Exports quite trifling.

The flour trade has been steady through the month. Commencing with prices little more than nominal, they have closed with practicable quotations, more especially for American barrels, of which there have been no important arrivals since August. Fine qualities have been exceedingly scarce, and reached high rates in retail, say 26s. per barrel, and over. The heat of the last summer injuriously affected much of the flour; and large quantities of the best have become sour. For such 22s. per barrel has been paid. Norfolks of average quality have ruled at 30s. per sack. Town flour was reduced from 43s. to 40s. per sack on the first Monday, at which it has remained, with, however, every prospect of its regaining the former price. The imports for four weeks into London were 66,772 sacks English, 3,311 sacks 31,776

barrels foreign, against 68,171 sacks English, 2,396 sacks 54,657 barrels foreign, in 1862.

The barley trade has been very heavy all through the month, excepting for the very primest malting sorts; and even these have given way fully 1s. per qr. Secondary qualities have been fully 2s. per qr. cheaper, and grinding about 1s., better supplies of the latter having come to hand. As maize, however, has risen materially in America, in consequence of an early frost taking the plants before maturity, we do not expect much further decline in the lower sorts, though considerable shipments have been made for this port, while the best malting may be worth from 38s. to 40s. Medium foreign, say Danish and French, have been selling at 28s., and low grinding at 24s. per qr. The imports for four weeks into London were 21,855 qrs. English 50,802 qrs. foreign, against 20,613 qrs. English, 39,159 qrs. foreign, in 1862, for the same period.

With a considerable falling off in the supply of English and foreign oats this month, neither of which have been half what they were in October, some reaction has taken place on the very low prices recently current; but the gain hitherto has scarcely exceeded 1s. per qr., though buyers in retail might find it more. Fair useful old Russian descriptions have been procurable at 18s. to 20s. per qr.; and we think a further enhancement is more probable than a recurrence of the unusually low rates lately paid. The imports into London for the four weeks have been, in English sorts 11,776 qrs., Scotch 5,764 qrs., Irish 11,580 qrs., foreign 84,721 qrs., against 26,036 qrs. English, 1,940 qrs. Scotch, 8,022 qrs. Irish, 208,938 qrs. foreign, for the same time in 1862.

The value of beans, during the month, has rather hardened, notwithstanding fair supplies; and for the same reason that we do not expect lower rates in barley—viz., the future diminution of the supply of maize—as well as from the approach of wintry weather, we do not anticipate a decline in this pulse. There is another consideration, also, likely to maintain its value, which is, the high price of linseed for feeding. The most recent quotations from Alexandria were 24s. 6d. to 26s. 6d. per qr., freights 3s. 6d. per qr., the best Egyptian being worth here about 32s. The imports in four weeks were 4,419 qrs. English, 12,667 qrs. foreign, against 4,796 qrs. English, 5,028 qrs. foreign, in 1862.

With but small supplies of native peas, and almost nothing, till lately, from abroad, so little demand has obtained for this grain, that prices have remained low and stationary. The mild weather has been completely against any inquiry for boilers; and other corn being cheaper than those for hog-feed, no active demand has obtained for them. We do not, however, expect them to continue in this neglect, but rather look for a better business, at somewhat improved prices. The imports in four weeks were 3,002 qrs. English, 2,978 qrs. foreign, against 3,274 qrs. English, 7,027 qrs. foreign, in 1862.

The linseed supplies have increased, there being no such arrivals since last March; and prices have, therefore, been somewhat reduced;

but the slightest falling off would again harden them, stocks on hand being extremely small, and the crop generally considered short.

Cakes of all kinds have been fairly saleable, at fully former rates.

The seed trade through the month has been very quiet. The non-appearance of new canary-seed has served to confirm the first reports that almost none was grown this year, from the lowness of rates. Prices, therefore, have been well kept up, and range from 50s. to 60s. per qr., there being but little fine on hand. New red English cloverseed of fair quality has begun to appear, and fine has brought as much as 64s. per cwt.; but French and American have been neglected, though low-priced. Trefoil has been in calm, and nominally the same, as well as mustard-seed, crushers being well in stock.

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:		Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Oct. 10, 1863	....	41	0	34	7	19	4	31	5	37	0	86	4
Oct. 17, 1863	....	40	4	34	0	18	8	29	2	36	6	84	7
Oct. 24, 1863	....	40	0	33	11	18	7	28	9	36	5	85	8
Oct. 31, 1863	....	39	10	34	0	18	11	28	0	35	8	85	2
Nov. 7, 1863	....	40	0	34	2	18	7	28	4	35	10	85	0
Nov. 14, 1863	....	39	10	34	0	18	9	28	0	35	8	84	1
Aggregate Average	....	40	2	34	1	18	10	28	5	36	3	85	2
Same time last year	....	49	0	35	1	21	8	33	7	39	4	41	11

PRICES OF SEEDS.

BRITISH SEEDS.

MUSTARD, per bush., white	.....	9s. 6d. to 10s.
CORIANDER, per cwt.	.....	14s. 16s.
CANARY, per qr.	.....	50s. 60s.
TARE, winter, new, per bushel	.....	5s. 5s. 6d.
TREFOIL	.....	24s. 27s.
LINSEED, per qr., sowing — s. to 70s. crushing	.....	58s. 64s.
LINSEED CAKES, per ton	.....	£9 10s. to £10 10s.
RAPESEED, per qr.	.....	62s. to 65s.
RAPE CAKE, per ton	.....	£6 10s. to £6 0s.

FOREIGN SEEDS.

CLOVERSEED, red — s. to — s., white	.....	— s. to — s.
HEMPSEED, small — s. per qr., Dutch	.....	— s. 42s.
TREFOIL	.....	22s. 21s.
CARRAWAY	.....	— s. — s.
CORIANDER, per cwt.	.....	16s. 18s.
LINSEED, per qr., Baltic 58s. to 60s.	.....	Bombay 68s. — s.
LINSEED CAKE, per ton	.....	£9 10s. to £11 0s.
RAPESEED, Dutch	.....	— s. to — s.
RAPE CAKE, per ton	.....	£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, Nov. 23.—For the advanced period of the season, the business effected during the past week must be deemed heavy, some very considerable sales having been made to the large consumers, which have materially reduced the quantity of fair samples on offer. Prices are firm for every description.

Mid and East Kents	.....	112s. 135s. 160s.
Weald of Kents	.....	105s. 120s. 132s.
Sussex	.....	100s. 112s. 120s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

Yorkshire Flukes	 per ton	80s. to 90s.
" Regents	.....	65s. to 70s.
Kent and Essex ditto	.....	60s. to 70s.
" Rocks	.....	50s. to 60s.
Perth, Forfar, and Fifeshire Regents	.....	60s. to 65s.
" " Rocks	.....	50s. to 55s.

BOROUGH AND SPITALFIELDS.

Yorkshire Regents	.....	70s. to 80s. per ton.
Ditto Flukes	.....	90s. to 100s. "
Kent and Essex Regents	..	60s. to 80s. "
Ditto Rocks	.....	50s. to 60s. "
Perth, Forfar, and Fifeshire Regents	.....	70s. to 80s. "

COUNTRY POTATO MARKETS.—DONCASTER, (Saturday last): A good supply of Potatoes, which met with a slow demand at the following prices—wholesale 4s. 6d. to 5s. 6d. per 18 stones, retail 6d. to 7d. per peck. MALTON, (Saturday last): The Potato market is well supplied, and is firm at last week's rates. MANCHESTER, (Saturday last): Potatoes 4s. 6d. to 5s. per 252lbs. YORK, (Saturday last): This market was very dull, and there is no expectation of a rise in prices for some time to come. The wholesale price is 6s. per tub of 280lbs., and 6d. per peck retail.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Nov. 23.—Our trade keeps about the same.

Dorset, fine	.....	122s. to 124s. per cwt.
" Midding	.....	Nominal.
Devon	.....	114s. to 115s.
Fresh	.....	12s. to 15s. per doz. lbs.

WOOL MARKETS.

CURRENT PRICES OF ENGLISH WOOL.—Per lb.

Shropshire—Down tegs	.....	1s. 5d. to 2s. 1d.
" ewes	.....	1 11 1 11
" lambs	.....	1 4 1 4
Southdown tegs	.....	1 9 1 9
Leicestershire—Ewes and wethers	.....	1 5 1 11
" Lambs	.....	1 2 1 6
Somersetshire—Ewe and wether	.....	1 11 1 11
Hertfordshire—Ewe and wether	.....	1 8 1 10
Lincolnshire—Hoggets	.....	2 2 2 2
" Ewe and wether	.....	1 6 1 11
Wiltshire, Hampshire, &c.—Tegs	.....	1 10 1 11
" Ewe and wether	.....	1 9 1 9
" Lamb	.....	1 5 1 8
Kent—Teg	.....	2 1 2 2
" Ewe and wether	.....	2 0 2 0
" Lamb	.....	1 6 1 6
Norfolk, Suffolk, and Essex—Tegs	.....	1 9 1 9
" Ewe and wether	.....	1 8 1 11

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from the importers' stores, or ex ship (30 tons) £12 5s. p. ton; under 30 tons £12 10s.
Bones, £6 5s.; crushed, £6 10s. per ton.
Animal Charcoal, (70 per cent. Phosphate) £5 to £5 5s. per ton.
Coprolite, Cambridge, ground £3; Suffolk, £3 10s. to £3 12s. per ton.
Nitrate of Soda, 16s. per ton.
Sulphate of Ammonia, 15s. per ton.
Gypsum, 30s. per ton. Superphosphate of Lime, £5 10s. to £6 5s. p. ton.
Sulphuric Acid, concentrated 1-945 lb. per lb., brown 1-712 lb. p. lb.
Blood Manure, £7 10s. per ton. Dissolved Bones, £6 15s. per ton.
Laundered Cakes, best American, £10 10s. to £10 15s. per brl., ditto 9s. 10s. to £10 5s. per bag; English, £10 to £10 10s.
Hape Cake, £5 5s. to £5 15s. per ton.
Cottonseed Cake, £5 10s. to £6 per ton.

E. PURSER, London Manure Company,
116, Fenchurch Street, E.C.

LIVERPOOL SEED AND GUANO, &c., MARKET.

Guano, Peruvian £12 7 6 to £1 0 0	.....	Linseed Cake, per ton—
Do. Upper do 5 17 6 8 0 0	.....	Americ. thin, hgs. £2 0 0 to 5 5
Patagonian 0 0 0 0 0 0	.....	Do. in brls. .. 0 0 0 0 0 0
Kooria Moorina 3 10 0 0 0 0	.....	English 9 15 0 10 0 0
Bone Ash 4 15 0 5 0 0	.....	Catad. Cake, decort. 7 10 0 7 15 0
Saltpetre, Bengal,	.....	Brimstone, 24 & 34 6 12 6 7 15 0
2 per cent. 0 0 0 0 0 0	.....	Nitr. of Soda, p. ct. 0 11 5 0 11 6
Cloverseed, new	.....	Linad. Bomby, p. ct. 3 7 0 0 0 0
red, per cwt. 1 18 0 2 0 0	.....	Tallow, 1st P.Y.G. 2 5 0 0 0 0

SAMUEL DOWNES AND CO., General Brokers,
Exchange Court, Liverpool.

END OF VOLUME XLIV.

